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That Share of Glory BY C. M. KORNBLUTH

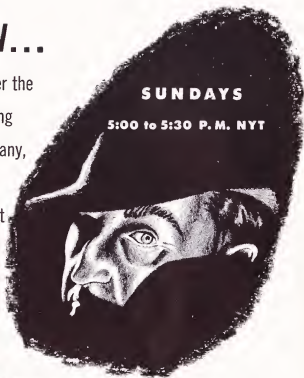
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Astounding SCIENCE FICTION

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COVER BY ROGERS

Illustrations by Cartier, Rogers and van Dongen.

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35c per Copy

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Slan first appeared, in magazine form, in the fall of 1940. It was issued in book form, five years later, in a limited edition that was quickly sold out. Lately it has not been uncommon for readers to offer \$10 or \$15 for a copy; and there is at least one authenticated instance of a copy changing hands for \$37.

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than just the \$37) audience. Van Vogt thought that was a fine idea, too. And, being a perfectionist, he worked over the book again, revising, adapting, tightening, and polishing. The basic story is unchanged; it is just a bit more of a masterpiece, that's all.

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PROPOSED HISTORY

One of the major puzzles of history is the system of facts regarding the occurrence and disappearance of man's empires. Briefly, the facts appear to be:

1. For about seventy-five thousand years, *homo sapiens*, in his present form, inhabited Earth, and had a low level of village-nomad tribe culture. This pattern continued, practically unchanged, spread over the entire planet, for millennia.

2. About seven thousand years ago, the first empire of man appeared. From a level, millennia-ancient cultural pattern, abruptly a totally new form of organization burst into sight.

3. The first empire fell. Thereafter a rapid sequence of empires rose and fell.

4. The empires came more and more rapidly, more and more widely spread.

5. At present we have a world-empire, in the sense of a world domination of Western Technical culture.

I propose a new angle on solving the problem. The scientific method of

thought works by collecting data, organizing it, and trying to set up an hypothesis or theory that will explain all the known facts, with a minimum of postulate. I propose one postulate:

Proposed: *That homo superior appeared in the world about eight thousand years ago. That the mutation involved is purely mental. That it does not involve any physiologically recognizable characteristic. That the mutation is simply a greater ability to organize and apply facts.*

Let's study the consequences of this single postulate.

First, when *homo superior* was born, it represented the eventuation of a mutation that *homo sapiens* was capable of, and thus the appearance of an individual *homo superior* simply proved that *such mutations could occur*. Thus, the first *homo superior* need not be considered a unique individual. Hemophilia, one of the well-known mutations Man is subject to, occurs spontaneously, and not once, but many times.

However, let us allow the appear-

ance of *homo superior*. In that time, human civilization was at a village level, communication was very poor, and there was strong inbreeding in each little tribal group. No one individual, however strong, could change the way of life of the whole village. Not at once, that is—but his genes, spread throughout the village by the inbreeding characteristic of the cultural level, would change things.

A century—two centuries—maybe five centuries, and the village would reach what we might call a critical concentration of *homo superior* genes. The village changes—its pattern of culture changes, and the tribe sets out to organize a greater area, a larger horizon. The First Empire probably wasn't very large—maybe a dozen villages were attacked and forced into the new pattern, and a staff of satraps, governors, chieftains, or whatever they may have been called, sent from the original village to rule them. Communication between the villages was set up and maintained. The old tribal inbreeding broken down . . .

And the empire crashed. No critical concentration of *homo superior* genes because of the new dilution. Back to the village level of culture, back to inbreeding—and reconcentration of those new, powerful characteristics! Now a dozen villages are concentrating the genes. And now—well, the next time, a dozen villages of *homo superior* start out and set up a *real* empire.

And, by improving communications, dilute themselves out of the concentration of organizational genes they need. And the new empire crashes. More spectacularly this time; it rose a lot higher, and a lot wider, before it went down.

The cycle of history is under way. The empires rise, spread, dilute their concentration of superior genes, and fall. The failure of communications after the fall allows reconcentration, re-inbreeding, and a new empire's rise. But each empire, in its heyday, spreads wider the new, strong genes of *homo superior*; each empire is larger. Empires rise, then, not one at a time, after lapses of centuries, but two, three—half a dozen at a time, warring with each other. Finally Rome rises, embracing many old empires, spreads wider than ever—and never quite falls. For now, the strong, new genes have been so widely spread that total reversion to the village level never quite returns. *Homo sapiens*, the serf, doesn't move around much, but the higher concentration of *homo superior* genes in the aristocracy group gets well spread. And gradually, the reconcentration of the genes leads to revolution—and the development of the world empire of Man.

Simultaneously, similar developments of independent empires have occurred in the Far East, in Africa, South America, and elsewhere. *Homo superior* is a mutation of which *homo sapiens* is capable; it can, and does,

rise spontaneously in any area.

But now, the cycle of history is perhaps finished; with the world-wide distribution of *homo superior* genes reaching the necessary critical level, and surpassing that critical level-for-empire, we are entering a new phase. The technological phase, where the concentration of *homo superior* genes is great enough to support a *technical* empire. And, too, *homo superior* must, himself, be open to mutation . . .

This suggestion—by the introduction of one postulate—that *homo superior* has already appeared—does seem to explain most of the observed data of history. I am not a sufficiently practiced student of history to develop the detailed nature of the proposal, nor of its ramifications. I propose it as a speculation of interest to many readers. And I add one more ramification that is, I think, of the highest interest. At last, race prejudice makes good, sound sense. But on a basis that will be the total despair of all professional race-haters! For the idea, if true, means that there are two true races of man; *homo sapiens* and *homo superior*. But that there is no such thing as a pure-bred *homo superior*, since, by the nature of things, *homo superior* inevitably has always crossbred with *homo sapiens*. There is only a greater or lesser degree of hybridization. We are, all of us, mongrel half-breeds, part *sapiens*, part *superior*. And Kipling was right: "But there is neither border nor breed nor

birth, when two strong men stand face to face, though they come from the ends of the Earth."

For homo superior has no physiological distinguishing marks. As an early philosopher said, "By their fruits, ye shall know them." True; thus, and only thus, shall ye know them! Not by place of birth, education, body build, blood type or skin.

George Washington was, obviously, possessed of a great share of *homo superior* genes. And George Washington Carver, one of the great agricultural chemists of world history, was also of the same fine breed—though he happened to have a black skin. I claim some kinship to George Washington Carver, some right to claim that I, too, have a certain strain of *homo superior*, and prefer to minimize the kinship with the white-skinned, but fruitless "white trash" of the world.

Because there is no distinguishing mark save their own accomplishments, no presently-accepted basis of "race" distinction makes any important sense whatsoever. *Homo superior* is here—but only by his works can you find him. Confucius, Einstein, George Washington, Moses, Plato, Jean Cristophe, the Black Napoleon, and Abraham Lincoln all belonged to one race, the race of Imperial Man—*homo superior*.

And each was a mongrel hybrid—even as you and I!

THE EDITOR.



THAT SHARE OF GLORY

BY C. M. KORNBLUTH

A language is more than a pattern of words; it's part and parcel of a vaster system of concomitant traditions and cultural beliefs. And being a Translator for a galaxy of planetary folk . . .

Illustrated by Rogers

Young Alen, one of a thousand in the huge refectory, ate absent-mindedly as the reader droned into the perfect silence of the hall. Today's lesson happened to be a word-list of the Thetis VIII planet's sea-going folk.

"*Tlon* — a ship," droned the reader.

"*Rllo* — some ships, number unknown.

"*Long* — some ships, number known, always modified by cardinal.

"*Ongr* — a ship in a collection of ships, always modified by ordinal.

"*Ngrt* — first ship in a collection of

ships; an exception to *ongr*."

A lay brother tiptoed to Alen's side. "The Rector summons you," he whispered.

Alen had no time for panic, though that was the usual reaction to a summons from the Rector to a novice. He slipped from the refectory, stepped onto the northbound corridor and stepped off at his cell, a minute later and a quarter-mile farther on. Hastily, but meticulously, he changed from his drab habit to the heraldic robes in the cubicle with its simple stool, wash-

stand, desk, and paperweight or two. Alen, a level-headed young fellow, was not aware that he had broken any section of the Order's complicated Rule, but he was aware that he could have done so without knowing it. It might, he thought, be the last time he would see the cell.

He cast a glance which he hoped would not be the final one over it; a glance which lingered a little fondly on the reel rack where were stowed: "Nicholson on Martian Verbs," "The New Oxford Venusian Dictionary," the ponderous six-reeler "Deutsche-Ganymediche Konversationslexikon" published long ago and far away in Leipzig. The later works were there, too: "The Tongues of the Galaxy — An Essay in Classification," "A Concise Grammar of Cephean," "The Self-Pronouncing Vegan II Dictionary" — scores of them, and, of course, the worn reel of old Machiavelli's "The Prince."

Enough of that! Alen combed out his small, neat beard and stepped onto the southbound corridor. He transferred to an eastbound at the next intersection and minutes later was before the Rector's lay secretary.

"You'd better review your Lyran irregulars," said the secretary disrespectfully. "There's a trader in there who's looking for a cheap herald on a swindling trip to Lyra VI." Thus unceremoniously did Alen learn that he was not to be ejected from the Order but that he was to be elevated to

Journeyman. But as a herald should, he betrayed no sign of his immense relief. He did, however, take the secretary's advice and sensibly reviewed his Lyran.

While he was in the midst of a declension which applied only to inanimate objects, the voice of the Rector — and what a mellow voice it was! — floated through the secretary's intercom.

"Admit the novice, Alen," said the Master Herakl.

A final settling of his robes and the youth walked into the Rector's huge office, with the seal of the Order blazing in diamonds above his desk. There was a stranger present; presumably the trader — a black-bearded fellow whose rugged frame didn't carry his Vegan cloak with ease.

Said the Rector: "Novice, this is to be the crown of your toil if you are acceptable to—?" He courteously turned to the trader, who shrugged irritably.

"It's all one to me," growled the blackbeard. "Somebody cheap, somebody who knows the cant of the thievish Lyran gem peddlers, above all, somebody *at once*. Overhead is devouring my flesh day by day as the ship waits at the field. And when we are space-borne, my imbecile crew will doubtless waste liter after priceless liter of my fuel. And when we land the swindling Lyrans will without doubt make my ruin complete by tricking me

even out of the minute profit I hope to realize. Good Master Herald, let me have the infant cheap and I'll bid you good day."

The Rector's shaggy eyebrows drew down in a frown. "Trader," he said sonorously, "our mission of galactic utilitarian culture is not concerned with your margin of profit. I ask you to test this youth and, if you find him able, to take him as your Herald on your voyage. He will serve you well, for he has been taught that commerce and words, its medium, are the unifying bonds which will one day unite the cosmos into a single humankind. Do not conceive that the College and Order of Herald's is a mere aid to you in your commercial adventure."

"Very well," growled the trader. He addressed Alen in broken Lyran: "Boy, how you make up Vegan stones of three fires so Lyran women like, come buy, buy again?"

Alen smoothly replied: "The Vegan triple-fire gem finds most favor on Lyran and especially among its women when set in a wide glass anklet if large, and when arranged in the Lyran 'lucky five' pattern in a glass thumb-ring if small." He was glad, very glad, he had come across — and as a matter of course memorized, in the relentless fashion of the Order — a novel which touched briefly on the Lyran jewel trade.

The trader glowered and switched to Cephean — apparently his native

tongue. "That was well-enough said, Herald. Now tell me whether you've got guts to man a squirt in case we're intercepted by the thieving so-called Customs collectors of Eyolf's Realm between here and Lyra?"

Alen knew the Rector's eyes were on him. "The noble mission of our Order," he said, "forbids me to use any weapon but the truth in furthering cosmic utilitarian civilization. No, master trader, I shall not man one of your weapons."

The trader shrugged. "So I must take what I get. Good Master Herald, make me a price."

The Rector said casually: "I regard this chiefly as a training mission for our novice; the fee will be nominal: Let us say twenty-five per cent of your net as of blastoff from Lyra, to be audited by Journeyman-Herald Alen."

The trader's howl of rage echoed in the dome of the huge room. "It's not fair!" he roared. "Who but you thievish villains with your Order and your catch-'em-young and your years of training can learn the tongues of the galaxy? What chance has a decent merchant busy with profit and loss got to learn the cant of every race between Sirius and the Coalsack? It's not fair! It's not fair and I'll say so until my dying breath!"

"Die outside if you find our terms unacceptable, then," said the Rector. "The Order does not haggle."

"Well I know it," sighed the trader brokenly. "I should have stuck to my own system and my good father's

pump-flange factory. But no! I had to pick up a bargain in gems on Vegol Enough of this — bring me your contract and I'll sign it."

The Rector's shaggy eyebrows went went up. "There is no contract," he said. "A mutual trust between Herald and trader is the cornerstone upon which cosmos-wide amity and understanding will be built."

"At twenty-five per cent of an unlicked pup," muttered blackbeard to himself in Cephean.

None of his instructors had played Polonius as Alen, with the seal of the Journeyman-Herald on his brow, packed for blastoff and vacated his cell. He supposed they knew that twenty years of training either had done their work or had not.

The trader taking Alen to the field where his ship waited, was less wise. "The secret of successful negotiation," he weightily told his Herald, "is to yield willingly. This may strike you as a paradox, but it is the veritable key to my success in maintaining the profits of my good father's pump-flange trade. The secret is to yield with rueful admiration of your opponent — but *only in unimportant details*. Put up a little battle about delivery date or about terms of credit and then let him have his way. But you never give way a hair's breadth on your asking price unless —"

Alen let him drivel on as they drove through the outer works of the Col-

lege. He was glad the car was open. For the first time he was being accorded the doffed hat that is the due of Heralds from their inferiors in the Order, and the grave nod of salutation from equals. Five-year-old postulants seeing his brow-seal tugged off their headgear with comical celerity; fellow-novices, equals a few hours before, uncovered as though he were the Rector himself.

The ceremonial began to reach the trader. When, with a final salutation, a lay warder let them through the great gate of the curtain wall, he said with some irritation: "They appear to hold you in high regard, boy."

"I am better addressed as 'Herald'," said Alen composedly.

"A plague descend on the College and Order! Do you think I don't know my manners? Of course, I call a Herald 'Herald,' but we're going to be cooped up together and you'll be working for me. What'll happen to ship's discipline if I have to kowtow to you?"

"There will be no problem," said Alen.

Blackbeard grunted and trod fiercely on the accelerator.

"That's my ship," he said at length. "*Starsong*. Vegan registry — it may help passing through Eyolf's Realm, though it cost me overmuch in bribes. A crew of eight, lazy, good-for-nothing wastrels — Agh! Can I believe my eyes?" The car jammed to a halt before the looming ship and blackbeard was up the ladder and through the

port in a second. Settling his robes, Alen followed.

He found the trader fiercely denouncing his chief engineer for using space drive to heat the ship; he had seen the faint haze of a minimum exhaust from the stern tubes.

"For that, dolt," screamed blackbeard, "we have a thing known as electricity. Have you by chance ever heard of it? Are you aware that a chief engineer's responsibility is the efficient and *economical* operation of his ship's drive mechanism?"

The chief, a cowed-looking Cephean, saw Alen with relief and swept off his battered cap. The Herald nodded gravely and the trader broke off in irritation. "We need none of that bowing and scraping for the rest of the voyage," he declared.

"Of course not, sir," said the chief. "O'course not. I was just welcoming the Herald aboard. Welcome aboard, Herald. I'm Chief Elwon, Herald. And I'm glad to have a Herald with us." A covert glance at the trader. "I've voyaged with Heralds and without, and I don't mind saying I feel safer indeed with you aboard."

"May I be taken to my quarters?" asked Alen.

"Your — ?" began the trader, stupefied.

The chief broke in: "I'll fix you a cabin, Herald. We've got some bulkheads I can rig aft for a snug little space, not roomy, but the best a little

ship like this can afford."

The trader collapsed into a bucket seat as the chief bustled aft and Alen followed.

"Herald," the chief said with some embarrassment after he had collared two crewmen and set them to work, "you'll have to excuse our good master trader. He's new to the interstar lanes and he doesn't exactly know the jets yet. Between us we'll get him squared away."

Alen inspected the cubicle run up for him — a satisfactory enclosure affording him the decent privacy he rated. He dismissed the chief and the crewmen with a nod and settled himself on the cot.

Beneath the iron composure in which he had been trained, he felt scared and alone. Not even old Machiavelli seemed to offer comfort or council: "There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things," said Chapter Six.

But what said Chapter Twenty-Six? "Where the willingness is great, the difficulties cannot be great."

Starson was not a happy ship. Blackbeard's nagging stinginess hung over the crew like a thundercloud, but Alen professed not to notice. He walked regularly fore and aft for two hours a day greeting the crew members in their various native tongues and

then wrapping himself in the reserve the Order demanded — though he longed to salute them man-to-man, eat with them, gossip about their native planets, the past misdeeds that had brought them to their berths aboard the miserly *Starsong* and their hopes for the future. The Rule of the College and Order of Herald's decreed otherwise. He accepted the uncoverings of the crew with a nod and tried to be pleased because they stood in growing awe of him that ranged from Chief Elwon's lively appreciation of a Herald's skill to Wiper Jukkl's superstitious reverence. Jukkl was a low-browed specimen from a planet of the decadent Sirius system. He outdid the normal slovenliness of an all-male crew on a freighter — a slovenliness in which Alen could not share: Many of his waking hours were spent in his locked cubicle burnishing his metal and cleaning and pressing his robes. A Herald was never supposed to suggest by his appearance that he shared mortal frailties.

Blackbeard himself yielded a little, to the point of touching his cap sullenly. This probably was not so much awe at Alen's studied manner as respect for the incisive, lightning-fast job of auditing the Herald did on the books of the trading venture — absurdly complicated books with scores of accounts to record a simple matter of buying gems cheap on Vega and chartering a ship in the hope of selling them dearly on Lyra. The complicated

books and overlapping accounts did tell the story, but they made it very easy for an auditor to erroneously read a number of costs as far higher than they actually were. Alen did not fall into the trap.

On the fifth day after blastoff, Chief Elwon rapped, respectfully but urgently, on the door of Alen's cubicle.

"If you please, Herald," he urged, "could you come to the bridge?"

Alen's heart bounded in his chest, but he gravely said: "My meditation must not be interrupted. I shall join you on the bridge in ten minutes." And for ten minutes he methodically polished a murky link in the massive gold chain that fastened his boat-cloak — the "meditation." He donned the cloak before stepping out; the summons sounded like a full-dress affair in the offing.

The trader was stamping and fuming. Chief Elwon was riffling through his spec book unhappily. Astrogator Hufner was at the plot computer running up trajectories and knocking them down again. A quick glance showed Alen that they were all high-speed trajectories in the "evasive action" class.

"Herald," said the trader grimly, "we have broken somebody's detector bubble." He jerked his thumb at a red-lit signal. "I expect we'll be overhauled shortly. Are you ready to earn your twenty-five per cent of the net?"

Alen overlooked the crudity. "Are

you rigged for color video, merchant?" he asked.

"We are."

"Then I am ready to do what I can for my client."

He took the communicator's seat, stealing a glance in the still-blank screen. The reflection of his face was reassuring, though he wished he had thought to comb his small beard.

Another light flashed on, and Hufner quit the operator to study the detector board. "Big, powerful and getting closer," he said tersely. "Scanning for us with directionals now. Putting out plenty of energy —"

The loud-speaker of the ship-to-ship audio came to life.

"What ship are you?" it demanded in Vegan. "We are a Customs cruiser of the Realm of Eyolf. What ship are you?"

"Have the crew man the squirts," said the trader softly to the chief.

Elwon looked at Alen, who shook his head. "Sorry, sir," said the engineer apologetically. "The Herald —"

"We are the freighter *Starson*, Vegan registry," said Alen into the audio mike as the trader choked. "We are carrying Vegan gems to Lyra."

"They're on us," said the astro-gator despairingly, reading his instruments. The ship-to-ship video flashed on, showing an arrogant, square-jawed face topped by a battered naval cap.

"Lyra indeed! We have plans of our own for Lyra. You will heave to —" began the officer in the screen, before

he noted Alen. "My pardon, Herald," he said sardonically. "Herald, will you please request the ship's master to heave to for boarding and search? We wish to assess and collect Customs duties. You are aware, of course, that your vessel is passing through the Realm."

The man's accented Vegan reeked of Algol IV. Alen switched to that obscure language to say: "We were not aware of that. Are you aware that there is a reciprocal trade treaty in effect between the Vegan system and the Realm which specifies that freight in Vegan bottoms is dutiable only when consigned to ports in the Realm?"

"You speak Algolian, do you? You Heralds have not been underrated, but don't plan to lie your way out of this. Yes, I am aware of some such agreement as you mentioned. We shall board you, as I said, and assess and collect duty in kind. If, regrettably, there has been any mistake you are, of course, free to apply to the Realm for reimbursement. Now, heave to!"

"I have no intentions of lying. I speak the solemn truth when I say that we shall fight to the last man any attempt of yours to board and loot us."

Alen's mind was racing furiously through the catalogue of planetary folkways the Rule had decreed that he master. Algol IV — some ancestor-worship; veneration of mother; hand-to-hand combat with knives; compli-

mentary greeting, "May you never strike down a weaker foe"; folk-hero Gaarek unjustly accused of slaying a cripple and exiled but it was an enemy's plot —

A disconcerted shadow was crossing the face of the officer as Alen improvised: "You will, of course, kill us all. But before this happens I shall have messaged back to the College and Order of Heralds the facts in the case, with a particular request* that your family be informed. Your name, I think, will be remembered as long as Gaarek's — though not in the same way, of course; the Algolian whose hundred-man battle cruiser wiped out a virtually unarmed freighter with a crew of eight."

The officer's face was dark with rage. "You devil!" he snarled. "Leave my family out of this! I'll come aboard and fight you man-to-man if you have the stomach for it!"

Alen shook his head regretfully. "The Rule of my Order forbids recourse to violence," he said. "Our only permissible weapon is the truth."

"We're coming aboard," said the officer grimly. "I'll order my men not to harm your people. We'll just be collecting customs. If your people shoot first, my men will be under orders to do nothing more than disable them."

Alen smiled and uttered a sentence or two in Algolian.

The officer's jaw dropped and he croaked, after a pause: "I'll cut you to ribbons. You can't say that about my

mother, you —" and he spewed back some of the words Alen had spoken.

"Calm yourself," said the Herald gravely. "I apologize for my disgusting and unheraldic remarks. But I wished to prove a point. You would have killed me if you could; I touched off a reaction which had been planted in you by your culture. I will be able to do the same with the men of yours who come aboard. For every race of man there is the intolerable insult that must be avenged in blood."

"Send your men aboard under orders not to kill if you wish; I shall goad them into a killing rage. We shall be massacred, yours will be the blame and you will be disgraced and disowned by your entire planet." Alen hoped desperately that the naval crews of the Realm were, as reputed, a barbarous and undisciplined lot—

Evidently they were, and the proud Algolian dared not risk it. In his native language he spat again: "You devil!" and switched back into Vegan. "Freighter *Starsong*," he said bleakly, "I find that my space fix was in error and that you are not in Realm territory. You may proceed."

The astrogator said from the detector board, incredulously: "He's disengaging. He's off us. He's accelerating. Herald *what* did you say to him?"

But the reaction from blackbeard was more gratifying. Speechless, the trader took off his cap. Alen acknowledged the salute with a grave nod before he started back to his cubicle. It

was just as well, he reflected, that the trader didn't know his life and his ship had been unconditionally pledged in a finish fight against a hundred-man battle cruiser.

Lyra's principal spaceport was pocked and broken, but they made a fair-enough landing. Alen, in full heraldic robes, descended from *Starson* to greet a handful of port officials.

"Any metals aboard?" demanded one of them.

"None for sale," said the Herald. "We have Vegan gems, chiefly triple-fire." He knew that the dull little planet was short of metals and, having made a virtue of necessity was somehow prejudiced against their import.

"Have your crew transfer the cargo to the Customs shed," said the port official studying *Starson's* papers. "And all of you wait there."

All of them — except Alen — lugged numbered sacks and boxes of gems to the low brick building designated. The trader was allowed to pocket a handful for samples before the shed was sealed — a complicated business. A brick was mortared over the simple ironwood latch that closed the ironwood door, a pat of clay was slapped over the brick and the port seal stamped in it. A mechanic with what looked like a pottery blowtorch fed by powdered coal played a flame on the clay seal until it glowed orange-red and that was that.

"Herald," said the port official, "tell the merchant to sign here and

make his fingerprints."

Alen studied the document; it was a simple identification form. Blackbeard signed with the reed pen provided and fingerprinted the documented. After two weeks in space he scarcely needed to ink his fingers first.

"Now tell him that we'll release the gems on his written fingerprinted order to whatever Lyran citizens he sells to. And explain that this roundabout system is necessary to avoid metal smuggling. Please remove *all* metal from your clothes and stow it on your ship. Then we will seal that, too, and put it under guard until you are ready to take off. We regret that we will have to search you before we turn you loose, but we can't afford to have our economy disrupted by irresponsible introduction of metals." Alen had not realized it was that bad.

After the thorough search that extended to the confiscation of forgotten watches and pins, the port officials changed a sheaf of the trader's uranium-backed Vegan currency into Lyran legal tender based on man-hours. Blackbeard made a partial payment to the crew, told them to have a good liberty and check in at the port at sunset tomorrow for probable take-off.

Alen and the trader were driven to town in an unlikely vehicle whose power plant was a pottery turbine. The driver, when they were safely out on the open road, furtively asked whether they had any metal they



wanted to discard.

The trader asked sharply in his broken Lyran: "What you do you get metal? Where sell, how use?"

The driver, following a universal tendency, raised his voice and lapsed into broken Lyran himself to tell the strangers: "Black market science men pay much, much for little bit metal. Study, use build. Politicians make law no metal, what I care politicians? But you no tell, gentlemen?"

"We won't tell," said Alen. "But we have no metal for you."

The driver shrugged.

"Herald," said the trader, "what do you make of it?"

"I didn't know it was a political issue. We concern ourselves with the basic patterns of a people's behavior, not the day-to-day expressions of the patterns. The planet's got no heavy metals, which means there were no metals available to the primitive Lyrans. The lighter metals don't occur in native form or in easily-split compounds. They proceeded along the ceramic line instead of the metallic line and appear to have done quite well for themselves up to a point. No electricity, of course, no aviation and no space flight."

"And," said the trader, "naturally the people who make these buggies and that blowtorch we saw are scared witless that metals will be imported and put them out of business. So naturally they have laws passed prohibiting it."

"Naturally," said the Herald, looking sharply at the trader. But blackbeard was back in character a moment later. "An outrage," he growled. "Trying to tell a man what he can and can't import when he sees a decent chance to make a bit of profit."

The driver dropped them at a boardinghouse. It was half-timbered construction, which appeared to be swankier than the more common brick. The floors were plate glass, roughened for traction. Alen got them a double room with a view.

"What's that thing?" demanded the trader, inspecting the view.

The thing was a structure looming above the slate and tile roofs of the town — a round brick tower for its first twenty-five meters and then wood for another fifteen. As they studied it, it pricked up a pair of ears at the top and began to flop them wildly.

"Semaphore," said Alen.

A minute later blackbeard piteously demanded from the bathroom: "*How* do you make water come out of the tap? I touched it all over but nothing happened."

"You have to turn it," said Alen, demonstrating. "And that thing — you pull it sharply down, hold it and then release."

"Barbarous," muttered the trader. "Barbarous."

An elderly maid came in to show them how to string their hammocks and ask if they happened to have a bit of metal to give her for a souvenir.

They sent her away and, rather than face the public dining room, made a meal from their own stores and turned in for the night.

It's going well, thought Alen drowsily: going very well indeed.

He awoke abruptly, but made no move. It was dark in the double room, and there were stealthy, furtive little noises nearby. A hundred thoughts flashed through his head of Lyrans treachery and double-dealing. He lifted his eyelids a trifle and saw a figure silhouetted against the faint light of the big window. If a burglar, he was a clumsy one.

There was a stirring from the other hammock, the trader's. With a subdued roar that sounded like "Thieving villains!" blackbeard launched himself from the hammock at the intruder. But his feet tangled in the hammock cords and he belly-flopped on the floor.

The burglar, if it was one, didn't dash smoothly and efficiently for the door. He straightened himself against the window and said resignedly: "You need not fear. I will make no resistance."

Alen rolled from the hammock and helped the trader to his feet. "He said he doesn't want to fight," he told the trader.

Blackbeard seized the intruder and shook him like a rat. "So the rogue is a coward too!" he boomed. "Give us a light, Herald."

Alen uncovered the slow-match, blew it to a flame, squeakily pumped up a pressure torch until a jet of pulverized coal sprayed from its nozzle and ignited it. A dozen strokes more and there was enough heat feeding back from the jet to maintain the pressure cycle.

Through all of this the trader was demanding in his broken Lyran: "What make here, thief? What reason thief us room?"

The Herald brought the hissing pressure lamp to the window. The intruder's face was not the unhealthy, neurotic face of a criminal. Its thin lines told of discipline and thought.

"What did you want here?" asked Alen.

"Metal," said the intruder simply. "I thought you might have a bit of iron."

It was the first time a specific metal had been named by any Lyran. He used, of course, the Vegan word for iron.

"You are particular," remarked the Herald. "Why iron?"

"I have heard that it possesses certain properties — perhaps you can tell me before you turn me over to the police. Is it true, as we hear, that a mass of iron whose crystals have been aligned by a sharp blow will strongly attract another piece of iron with a force related to the distance between them?"

"It is true," said the Herald, studying the man's face. It was lit with ex-

citement. Deliberately Alen added: "This alignment is more easily and uniformly effected by placing the mass of iron in an electric field — that is, a space surrounding the passage of an electron stream through a conductor." Many of the words he used had to be Vegan; there were no Lyran words for "electric," "electron" or "conductor."

The intruder's face fell. "I have tried to master the concept you refer to," he admitted. "But it is beyond me. I have questioned other interstar voyagers and they have touched on it, but I cannot grasp it — But thank you, sir; you have been very courteous. I will trouble you no further while you summon the watch."

"You give up too easily," said Alen. "For a scientist, much too easily. If we turn you over to the watch, there will be hearings and testimony and whatnot. Our time is limited here on your planet; I doubt that we can spare any for your legal processes."

The trader let go of the intruder's shoulder and grumbled: "Why you no ask we have iron, I tell you no. Search, search, take all metal away. We no police you. I sorry hurted you arms. Here for you." Blackbeard brought out a palmful of his sample gems and picked out a large triple-fire stone. "You not be angry me," he said, putting it in the Lyran's hand.

"I can't —" said the scientist.

Blackbeard closed his fingers over the stone and growled: "I give, you take. Maybe buy iron with, eh?"

"That's so," said the Lyran. "Thank you both, gentlemen. Thank you —"

"You go," said the trader. "You go, we sleep again."

The scientist bowed with dignity and left their room.

"Gods of space," swore the trader. "To think that Jukkl, the *Starsong's* wiper, knows more about electricity and magnetism than a brainy fellow like that."

"And they are the key to physics," mused Alen. "A scientist here is dead-ended forever, because their materials are all insulators! Glass, clay, glaze, wood."

"Funny, all right," yawned blackbeard. "Did you see me collar him once I got on my feet? Sharp, eh? Good night, Herald." He gruntingly hauled himself into the hammock again, leaving Alen to turn off the hissing light and cover the slow-match with its perforated lid.

They had roast fowl of some sort or other for breakfast in the public dining room. Alen was required by his Rule to refuse the red wine that went with it. The trader gulped it approvingly. "A sensible, though backward people," he said. "And now if you'll inquire of the management where the thievish jewel-buyers congregate, we can get on with our business and perhaps be off by dawn tomorrow."

"So quickly?" asked Alen, almost forgetting himself enough to show surprise.

"My charter on *Starsong*, good Herald — thirty days to go, but what might not go wrong in space? And then there would be penalties to mulct me of whatever minute profit I may realize."

Alen learned that Gromeg's Tavern was the gem mart and they took another of the turbine-engined cabs through the brick-paved streets.

Gromeg's was a dismal, small-windowed brick barn with heavy-set men lounging about, an open kitchen at one end and tables at the other. A score of smaller, sharp-faced men were at the tables sipping wine and chatting.

"I am Journeyman-Herald Alen," announced Alen clearly, "with Vegan gems to dispose of."

There was a silence of elaborate unconcern, and then one of the dealers spat and grunted: "Vegan gems. A drug on the market. Take them away, Herald."

"Come, master trader," said Alen in the Lyran tongue. "The gem dealers of Lyra do not want your wares." He started for the door.

One of the dealers called languidly: "Well, wait a moment. I have nothing better to do; since you've come all this way I'll have a look at your stuff."

"You honor us," said Alen. He and blackbeard sat at the man's table. The trader took out a palmful of samples, counted them meaningfully and laid them on the boards.

"Well," said the gem dealer, "I don't know whether to be amused or

insulted. I am Garthkint, the gem dealer — not a retailer of *beads*. However, I have no hard feelings. A drink for your frowning friend, Herald? I know you gentry don't indulge." The drink was already on the table, brought by one of the hulking guards.

Alen passed Garthkint's own mug of wine to the trader, explaining politely: "In my master trader's native Cepheus it is considered honorable for the guest to sip the drink his host laid down and none other. A charming custom, is it not?"

"Charming, though unsanitary," muttered the gem dealer — and he did not touch the drink he had ordered for blackbeard.

"I can't understand a word either of you is saying — too flowery. Was this little rat trying to drug me?" demanded the trader in Cephean.

"No," said Alen. "Just trying to get you drunk." To Garthkint in Lyran, he explained, "The good trader was saying that he wishes to leave at once. I was agreeing with him."

"Well," said Garthkint, "perhaps I can take a couple of your gauds. For some youngster who wishes a cheap ring."

"He's getting to it," Alen told the trader.

"High time," grunted blackbeard.

"The trader asks me to inform you," said Alen, switching back to Lyran, "that he is unable to sell in lots smaller than five hundred gems."

"A compact language, Cephean," said Garthkint, narrowing his eyes.

"Is it not?" Alen blandly agreed.

The gem dealer's forefinger rolled an especially fine three-fire stone from the little pool of gems on the table. "I suppose," he said grudgingly, "that this is what I must call the best of the lot. What, I am curious to know, is the price you would set for five hundred equal in quality and size to this poor thing?"

"This," said Alen, "is the good trader's first venture to your delightful planet. He wishes to be remembered and welcomed all of the many times he anticipates returning. Because of this he has set an absurdly low price, counting good will as more important than a prosperous voyage. Two thousand Lyran credits."

"Absurd," snorted Garthkint. "I cannot do business with you. Either you are insanely rapacious or you have been pitifully misguided as to the value of your wares. I am well-known for my charity; I will assume that the latter is the case. I trust you will not be too downcast when I tell you that five hundred of these muddy, undersized out-of-round objects are worth no more than two hundred credits."

"If you are serious," said Alen with marked amazement, "we would not dream of imposing on you. At the figure you mention, we might as well not sell at all but return with our wares to Cepheus and give these gems to children in the streets for marbles.

Good gem trader, excuse us for taking up so much of your time and many thanks for your warm hospitality in the matter of the wine." He switched to Cephean and said: "We're'dickering now. Two thousand and two hundred. Get up; we're going to start to walk out."

"What if he lets us go?" grumbled blackbeard, but he did heave himself to his feet and turn to the door as Alen rose.

"My trader echoes my regrets," the Herald said in Lyran. "Farewell."

"Well, stay a moment," said Garthkint. "I am well-known for my soft heart toward strangers. A charitable man might go as high as five hundred and absorb the inevitable loss. If you should return some day with a passable lot of *real* gems, it would be worth my while for you to remember who treated you with such benevolence and give me fair choice."

"Noble Lyran," said Alen, apparently almost overcome. "I shall not easily forget your combination of acumen and charity. It is a lesson to traders. It is a lesson to me. I shall *not* insist on two thousand. I shall cut the throat of my trader's venture by reducing his price to eighteen hundred credits, though I wonder how I shall dare tell him of it."

"What's going on now?" demanded blackbeard.

"Five hundred and eighteen hundred," said Alen. "We can sit down again."

"Up, down — up, down," muttered the trader.

They sat, and Alen said in Lyran: "My trader unexpectedly indorses the reduction. He says, 'Better to lose some than all' — an old proverb in the Cephean tongue. And he forbids any further reduction."

"Come, now," wheedled the gem dealer. "Let us be men of the world about this. One must give a little and take a little. Everybody knows he can't have his own way forever. I shall offer a good, round eight hundred credits and we'll close on it, eh? Pilquis, fetch us a pen and ink!" One of the burly guards was right there with an inkpot and a reed pen. Garthkint had a Customs form out of his tunic and was busily filling it in to specify the size, number and fire of gems to be released to him.

"What's it now?" asked blackbeard.

"Eight hundred."

"Take it!"

"Garthkint," said Alen regretfully, "you heard the firmness and decision in my trader's voice? What can I do? I am only speaking for him. He is a hard man but perhaps I can talk him around later. I offer you the gems at a ruinous fifteen hundred credits."

"Split the difference," said Garthkint resignedly.

"Done at eleven-fifty," said Alen.

That blackbeard understood. "Well done!" he boomed at Alen and took a swig at Garthkint's winecup. "Have

him fill in 'Sack eighteen' on his paper. It's five hundred of that grade."

The gem dealer counted out twenty-three fifty-credit notes and blackbeard signed and fingerprinted the release.

"Now," said Garthkint, "you will please remain here while I take a trip to the spaceport for my property." Three or four of the guards were suddenly quite close.

"You will find," said Alen dryly, "that our standard of commercial morality is no lower than yours."

The dealer smiled politely and left.

"Who will be the next?" asked Alen of the room at large.

"I'll look at your gems," said another dealer, sitting at the table.

With the ice-breaking done, the transactions went quicker. Alen had disposed of a dozen lots by the time their first buyer returned.

"It's all right," he said. "We've been tricked before, but your gems are as represented. I congratulate you, Herald, on driving a hard, fair bargain."

"That means," said Alen regretfully, "that I should have asked for more." The guards were once more lounging in corners and no longer seemed so menacing.

They had a mid-day meal and continued to dispose of their wares. At sunset Alen held a final auction to clean up the odd lots that remained over and was urged to stay to dinner.

The trader, counting a huge wad of

the Lyran manpower-based notes, shook his head. "We should be off before dawn, Herald," he told Alen. "Time is money, time is money."

"They are very insistent."

"And I am very stubborn. Thank them and let us be on our way before anything else is done to increase my overhead."

Something did turn up — a city watchman with a bloody nose and split lip.

He demanded of the Herald: "Are you responsible for the Cephean maniac known as Elwon?"

Garthkint glided up to mutter in Alen's ear: "Beware how you answer!"

Alen needed no warning. His grounding included Lyran legal concepts — and, on the backward little planet touched with many relics of feudalism "responsible" covered much territory.

"What has Chief Elwon done?" he parried.

"As you see," the watchman glumly replied, pointing to his wounds. "And the same to three others before we got him out of the wrecked wineshop and into the castle. Are you responsible for him?"

"Let me speak with my trader for a moment. Will you have some wine meantime?" He signaled and one of the guards brought a mug.

"Don't mind if I do. I can use it," sighed the watchman.

"We are in trouble," said Alen to blackbeard. "Chief Elwon is in the 'castle' — prison — for drunk and dis-

orderly conduct. You as his master are considered responsible for his conduct under Lyran law. You must pay his fines or serve his penalties. Or you can 'disown' him, which is considered dishonorable but sometimes necessary. For paying his fine or serving his time you have a prior lien on his services, without pay — but of course that's unenforceable off Lyra."

Blackbeard was sweating a little. "Find out from the policeman how long all this is likely to take. I don't want to leave Elwon here and I do want us to get off as soon as possible. Keep him occupied, now, while I go about some business."

The trader retreated to a corner of the darkening barnlike tavern, beckoning Garthkint and a guard with him as Alen returned to the watchman.

"Good keeper of the peace," he said, "will you have another?"

He would.

"My trader wishes to know what penalties are likely to be levied against the unfortunate Chief Elwon."

"Going to leave him in the lurch, eh?" asked the watchman a little beligerently. "A fine master you have!"

One of the dealers at the table indignantly corroborated him. "If you foreigners aren't prepared to live up to your obligations, why did you come here in the first place? What happens to business if a master can send his man to steal and cheat and then say: Don't blame *me* — it was *his* doing!"

Alen patiently explained: "On other

planets, good Lyrans, the tie of master and man is not so strong that a man would obey if he were ordered to go and steal or cheat."

They shook their heads and muttered. It was unheard-of.

"Good watchman," pressed the Herald, "my trader does not *want* to disown Chief Elwon. Can you tell me what recompense would be necessary — and how long it would take to manage the business?"

The watchman started on a third cup which Alen had unostentatiously signaled for. "It's hard to say," he told the Herald weightily. "For my damages, I would demand a hundred credits at least. The three other members of the watch battered by your lunatic could ask no less. The wineshop suffered easily five hundred credits' damage. The owner of it was beaten, but that doesn't matter, of course."

"No imprisonment?"

"Oh, a flogging, of course" — Alen started before he recalled that the "flogging" was a few half-hearted symbolic strokes on the covered shoulders with a light cane — "but no imprisonment. His Honor, Judge Krarl, does not sit on the night bench. Judge Krarl is a newfangled reformer, stranger. He professes to believe that mulcting is unjust — that it makes it easy for the rich to commit crime and go scot-free."

"But doesn't it?" asked Alen, drawn off-course in spite of himself.

There was pitying laughter around him.

"Look you," a dealer explained kindly. "The good watchman suffers battery, the mad Cephean or his master is mulcted for damages, the watchman is repaid for his injuries. What kind of justice is it to the watchman if the mad Cephean is locked away in a cell unfined?"

The watchman nodded approvingly. "Well-said," he told the dealer. "Luckily we have on the night bench a justice of the old school, His Honor, Judge Treel. Stern, but fair. You should hear him! 'Fifty credits! A hundred credits and the lash! Robbed a ship, eh? Two thousand credits!'" He returned to his own voice and said with awe: "For a murder, he never assesses less than *ten thousand credits!*"

And if the murderer couldn't pay, Alen knew, he became a "public charge," "responsible to the state" — that is, a slave. If he could pay, of course, he was turned loose."

"And His Honor, Judge Treel," he pressed, "is sitting tonight? Can we possibly appear before him, pay the fines and be off?"

"To be sure, stranger. I'd be a fool if I waited until morning, wouldn't I?" The wine had loosened his tongue a little too far and he evidently realized it. "Enough of this," he said. "Does your master honorably accept responsibility for the Cephean? If so, come along with me, the two of you, and we'll get this over with."

"Thanks, good watchman. We are coming."

He went to blackbeard, now alone in his corner, and said: "It's all right. We can pay off — about a thousand credits — and be on our way."

The trader muttered darkly: "Lyran jurisdiction or not, it's coming out of Elwon's pay. The bloody fool!"

They rattled through the darkening streets of the town in one of the turbine-powered wagons, the watchman sitting up front with the driver and the trader and the Herald behind.

"Something's burning," said Alen to the trader, sniffing the air.

"This stinking buggy —" began blackbeard. "Oops," he said, interrupting himself and slapping at his cloak.

"Let me, trader," said Alen. He turned back the cloak, licked his thumb, and rubbed out a crawling ring of sparks spreading across a few centimeters of the cloak's silk lining. And he looked fixedly at what had started the little fire. It was an improperly-covered slow-match protruding from a holstered device that was unquestionably a hand weapon.

"I bought it from one of their guards while you were parleying with the policeman," explained blackbeard embarrassedly. "I had a time making him understand. That Garthkint fellow helped." He fiddled with the perforated cover of the slow-match, screwing it on more firmly.

"A pitiful excuse for a weapon," he went on, carefully arranging his cloak over it. "The trigger isn't a trigger and the thumb-safety isn't a safety. You pump the trigger a few times to build up pressure, and a little air squirts out to blow the match to life. Then you uncover the match and pull back the cocking-piece. This levers a dart into the barrel. *Then* you push the thumb-safety which puffs coaldust into the firing chamber and also swivels down the slow-match onto a touch-hole. *Poof*, and away goes the dart if you didn't forget any of the steps or do them in the wrong order. Luckily, I also got a knife."

He patted the nape of his neck and said, "That's where they carry 'em here. A little sheath between the shoulderblades — wonderful for a fast draw-and-throw, though it exposes you a little more than I like when you reach. The knife's black glass. Splendid edge and good balance."

"And the thieving Lyrans knew they had me where it hurt. Seven thousand, five hundred credits for the knife and gun — if you can call it that — and the holsters. By rights I should dock Elwon for them, the bloody fool. Still, it's better to buy his way out and leave no hard feelings behind us, eh, Herald?"

"Incomparably better," said Alen. "And I am amazed that you even entertained the idea of an armed jail-delivery. What if Chief Elwon had to serve a few days in a prison? Would



that be worse than forever barring yourself from the planet and blackening the names of all traders with Lyra? Trader, do not hope to put down the credits that your weapons cost you as a legitimate expense of the voyage. I will not allow it when I audit your books. It was a piece of folly on which you spent personal funds, as far as the College and Order of Heralds is concerned."

"Look here," protested blackbeard. "You're supposed to be spreading utilitarian civilization, aren't you? What's utilitarian about leaving one of my crewmen here?"

Alen ignored the childish argument and wrapped himself in angry silence. As to civilization, he wondered darkly whether such a trading voyage and his part in it was relevant at all. Were the slanders true? Was the College and Order simply a collection of dupes headed by cynical oldsters greedy for luxury and power?

Such thoughts hadn't crossed his mind in a long time. He'd been too busy to entertain them, cramming his head with languages, folk-ways, mores, customs, underlying patterns of culture, of hundreds of galactic peoples — and for what? So that this fellow could make a profit and the College and Order take a quarter of that profit. If civilization was to come to Lyra, it would have to come in the form of metal. If the Lyrans didn't want metal, *make* them take it.

What did Machiavelli say? "The chief foundations of all states — are good laws and good arms; and as there cannot be good laws where the state is not well-armed, it follows that where they are well-armed, they have good laws." It was odd that the teachers had slurred over such a seminal idea, emphasizing instead the spiritual integrity of the weaponless College and Order — or was it?

The disenchantment he felt creeping over him was terrifying.

"The castle," said the watchman over his shoulder, and their wagon stopped with a rattle before a large but unimpressive brick structure of five stories.

"You wait," the trader told the driver after they got out. He handed him two of his fifty-credit bills. "You wait, you get many, many more money. You understand, wait?"

"I wait plenty much," shouted the driver delightedly. "I wait all night, all day. You wonderful master. You great, great master, I wait —"

"All right," growled the trader, shutting him off. "You wait."

The watchman took them through an entrance hall lit by hissing pressure lamps and casually guarded by a few liveried men with truncheons. He threw open the door of a medium-sized, well-lit room with a score of people in it, looked in, and uttered a despairing groan.

A personage on a chair that looked like a throne said sharply, "Are those

the star-travelers? Well, don't just stand there. Bring them in!"

"Yes, your honor, Judge Krarl," said the watchman unhappily.

"*It's the wrong judge!*" Alen hissed at the trader. "This one gives out jail sentences!"

"Do what you can," said black-beard grimly.

The watchman guided them to the personage in the chair and indicated a couple of low stools, bowed to the chair and retired to stand at the back of the room.

"Your honor," said Alen, "I am Journeyman-Herald Alen, Herald for the trading voyage —"

"Speak when you're spoken to," said the judge sharply. "Sir, with the usual insolence of wealth you have chosen to keep us waiting. I do not take this personally; it might have happened to Judge Treel, who — to your evident dismay — I am replacing because of a sudden illness, or to any other member of the bench. But as an insult to our justice, we cannot overlook it. Sir, consider yourself reprimanded. Take your seats. Watchman, bring in the Cephean."

"Sit down," Alen murmured to the trader. "This is going to be bad."

A watchman brought in Chief Elwon, bleary-eyed, tousled and sporting a few bruises. He gave Alen and the trader a shamefaced grin as his guard sat him on a stool beside them. The trader glared back.

Judge Krarl mumbled perfunctorily: "Let battle be joined among these several parties in this dispute let no man question our impartial awarding of the victory speak now if you yield instead to our judgment. *Well?* Speak up, you watchmen!"

The watchman who had brought the Herald and the trader started and said from the back of the room: "I yield instead to your honors judgment."

Three other watchmen and a battered citizen, the wineshop keeper, mumbled in turn: "I yield instead to your honors judgment."

"Herald, speak for the accused," snapped the judge.

Well, thought Alen, I can try. "Your Honor," he said, "Chief Elwon's master does not yield to your honor's judgment. He is ready to battle the other parties in the dispute or their masters."

"What insolence is this?" screamed the judge, leaping from his throne. "The barbarous customs of other worlds do not prevail in this court! Who spoke of battle — ?" He shut his mouth with a snap, evidently abruptly realizing that *he* had spoken of battle, in an archaic phrase that harked back to the origins of justice on the planet. The judge sat down again and told Alen, more calmly: "You have mistaken a mere formality. The offer was not made in earnest." Obviously, he didn't like the sound of that himself, but he proceeded, "Now say 'I yield instead to your honors judgment!' and we

can get on with it. For your information, trial by combat has not been practiced for many generations on our enlightened planet."

Alen said politely: "Your Honor, I am a stranger to many of the ways of Lyra, but our excellent College and Order of Herald's instructed me well in the underlying principles of your law. I recall that one of your most revered legal maxims declares: 'The highest crime against man is murder; the highest crime against man's society is breach of promise.'"

Purpling, the judge snarled: "Are you presuming to bandy law with me, you slippery-tongued foreigner? Are you presuming to accuse me of the high crime of breaking my promise? For your information, a promise consists of an offer to do, or refrain from doing, a thing in return for a consideration. There must be the five elements of promiser, promisee, offer, substance, and consideration."

"If you will forgive a foreigner," said Alen, suddenly feeling the ground again under his feet, "I maintain that you offered the parties in the dispute your services in awarding the victory."

"An empty argument," snorted the judge. "Just as an offer with substance from somebody to nobody for a consideration is no promise, or an offer without substance from somebody to somebody for a consideration is no promise, so my offer was no promise, for there was no consideration involved."

"Your honor, must the consideration be from the promisee to the promiser?"

"Of course not. A third party may provide the consideration."

"Then I respectfully maintain that your offer was a promise, since a third party, the government, provided you with the considerations of salary and position in return for you offering your services to the disputants."

"Watchmen, clear the room of uninterested persons," said the judge hoarsely. While it was being done, Alen swiftly filled in the trader and Chief Elwon. Blackbeard grinned at the mention of a five-against-one battle royal, and the engineer looked alarmed.

When the doors closed leaving the nine of them in privacy, the judge said bitterly: "Herald, where did you learn such devilish tricks?"

Alen told him: "My College and Order instructed me well. A similar situation existed on a planet called England during an age known as the Victorious. Trial by combat had long been obsolete, there as here, but had never been declared so — there as here. A litigant won a hopeless lawsuit by publishing a challenge to his opponent and appearing at the appointed place in full armor. His opponent ignored the challenge and so lost the suit by default. The English dictator, one Disraeli, hastily summoned his parliament to abolish trial by combat."

"And so," mused the judge, "I find myself accused in my own chamber of high crime if I do not permit you five to slash away at each other and decide who won."

The wineshop keeper began to blubber that he was a peaceable man and didn't intend to be carved up by that black-bearded, bloodthirsty star-traveler. All he wanted was his money.

"Silence!" snapped the judge. "Of course there will be no combat. Will you, shopkeeper, and you watchmen, withdraw if you receive satisfactory financial settlements?"

They would.

"Herald, you may dicker with them."

The four watchmen stood fast by their demand for a hundred credits apiece, and got it. The terrified shopkeeper regained his balance and demanded a thousand. Alen explained that his black-bearded master from a rude and impetuous world might be unable to restrain his rage when he, Alen, interpreted the demand and, ignoring the consequences, might beat him, the shopkeeper, to a pulp. The asking price plunged to a reasonable five hundred, which was paid over. The shopkeeper got the judge's permission to leave and backed out, bowing.

"You see, trader," Alen told blackbeard, "that it was needless to buy weapons when the spoken word —"

"And now," said the judge, with a sneer, "we are easily out of *that* di-

lemma. Watchmen, arrest the three star-travelers and take them to the cages."

"Your honor!" cried Alen, outraged.

"Money won't get you out of *this* one. I charge you with treason."

"The charge is obsolete —" began the Herald hotly, but he broke off as he realized the vindictive strategy.

"Yes, it is. And one of its obsolete provisions is that treason charges must be tried by the parliament at a regular session, which isn't due for two hundred days. You'll be freed and I may be reprimanded, but by my head, for two hundred days you'll regret that you made a fool of *me*. Take them away."

"A trumped-up charge against us. Prison for two hundred days," said Alen swiftly to the trader as the watchmen closed in.

"Why buy weapons?" mocked the blackbeard, showing his teeth. His left arm whipped up and down, there was a black streak through the air — and the judge was pinned to his throne with a black glass knife through his throat and the sneer of triumph still on his lips.

The trader, before the knife struck, had the clumsy pistol out, with the cover off the glowing match and the cocking piece back. He must have pumped and cocked it under his cloak, thought Alen numbly as he told the watchmen, without prompting: "Get back against the wall and turn around."

They did. They wanted to live, and the grinning blackbeard who had made meat of the judge with a flick of the arm was a terrifying figure.

"Well done, Alen," said the trader. "Take their clubs, Elwon. Two for you, two for the Herald. Alen, don't argue! I had to kill the judge before he raised an alarm—nothing but death will silence his breed. You may have to kill too before we're out of this. Take the clubs." He passed the clumsy pistol to Chief Elwon and said: "Keep it on their backs. The thing that looks like a thumb-safety is a trigger. Put a dart through the first one who tries to make a break. Alen, tell the fellow on the end to turn around and come to me slowly."

Alen did. Blackbeard swiftly stripped him, tore and knotted his clothes into ropes and bound and gagged him. The others got the same treatment in less than ten minutes.

The trader holstered the gun and rolled the watchmen out of the line of sight from the door of the chamber. He recovered his knife and wiped it on the judge's shirt. Alen had to help him prop the body behind the throne's high back.

"Hide those clubs," blackbeard said. "Straight faces. Here we go."

They went out, single file, opening the door only enough to pass. Alen, last in line, told one of the liveried guards nearby: "His honor, Judge Krarl, does not wish to be disturbed."

"That's news?" asked the tipstaff sardonically. He put his hand on the Herald's arm. "Only yesterday he gimme a blast when I brought him a mug of water he asked me for himself. An outrageous interruption, he called me, and he asked for the water himself. What do you think of that?"

"Terrible," said Alen hastily. He broke away and caught up with the trader and the engineer at the entrance hall. Idlers and loungers were staring at them as they headed for the waiting wagon.

"I wait!" the driver told them loudly. "I wait long, much. You pay more, more?"

"We pay more," said the trader. "You start."

The driver brought out a smoldering piece of punk, lit a pressure torch, lifted the barn-door section of the wagon's floor to expose the pottery turbine and preheated it with the torch. He pumped squeakily for minutes, spinning a flywheel with his other hand, before the rotor began to turn on its own. Down went the hatch, up onto the seats went the passengers.

"The spaceport," said Alen. With a slate-pencil screech the driver engaged his planetary gear and they were off.

Through it all, blackbeard had ignored frantic muttered questions from Chief Elwon, who had wanted nothing to do with murder, especially of a judge. "You sit up there," growled the trader, "and every so often you look around and see if we're being followed."

Don't alarm the driver. And if we get to the spaceport and blast off without any trouble, keep your story to yourself." He settled down in the back seat with Alen and maintained a gloomy silence. The young Herald was too much in awe of this stranger, so suddenly competent in assorted forms of violence, to question him.

They did get to the spaceport without trouble, and found the crew in the Customs shed, emptied of the gems by dealers with releases. They had built a fire for warmth.

"We wish to leave immediately," said the trader, to the port officer. "Can you change my Lyran currency?"

The officer began to sputter apologetically that it was late and the vault was sealed for the night —

"That's all right. We'll change it on Vega. It'll get back to you. Call off your guards and unseal our ship."

They followed the port officer to *Starson*'s dim bulk out on the field. The officer cracked the seal on her with his club in the light of a flaring pressure lamp held by one of the guards.

Alen was sweating hard through it all. As they started across the field he had seen what looked like two closely spaced green stars low on the horizon towards town suddenly each jerk up and towards each other in minute arcs. The semaphore!

The signal officer in the port administration building would be watching too—but nobody on the field, preoc-

cupied with the routine of departure, seemed to have noticed.

The lights flipped this way and that. Alen didn't know the code and bitterly regretted the lack. After some twenty signals the lights flipped to the "rest" position again as the port officer was droning out a set of take-off regulations: bearing, height above settled areas, permissible atomic fuels while in atmosphere—Alen saw somebody start across the field toward them from the administration building. The guards were leaning on their long, competent looking weapons.

Alen inconspicuously detached himself from the group around *Starson* and headed across the dark field to meet the approaching figure. Nearing it, he called out a low greeting in Lyran, using the noncom-to-officer military form.

"Sergeant," said the signal officer quietly, "go and draw off the men a few meters from the star-travelers. Tell them the ship mustn't leave, that they're to cover the foreigners and shoot if—"

Alen stood dazedly over the limp body of the signal officer. And then he quickly hid the bludgeon again and strolled back to the ship, wondering whether he'd cracked the Lyran's skull.

The port was open by then and the crew filing in. He was last. "Close it fast," he told the trader. "I had to—"

"I saw you," grunted blackbeard. "A semaphore message?" He was

working as he spoke, and the metal port closed.

"Astrogator and engineer, take over," he told them.

"All hands to their bunks," ordered Astrogator Hufner. "Blast-off immediate."

Alen took to his cubicle and strapped himself in. Blast-off deafened him, rattled his bones and made him thoroughly sick as usual. After what seemed like several wretched hours, they were definitely space-borne under smooth acceleration, and his nausea subsided.

Blackbeard knocked, came in, and unbuckled him.

"Ready to audit the books of the voyage?" asked the trader.

"No," said Alen feebly.

"It can wait," said the trader. "The books are the least important part, anyway. We have headed off a frightful war."

"War? We have?"

"You wondered why I was in such haste to get off Lyra, and why I wouldn't leave Elwon there. It is because our Vegan gems were most unusual gems. I am not a technical man, but I understand they are actual gems which were treated to produce a certain effect at just about this time."

Blackbeard glanced at his wrist chronometer and said dreamily: "Lyra is getting metal. Wherever there is one of our gems, pottery is decomposing into its constituent aluminum, silicon,

and oxygen. Fluxes and glazes are decomposing into calcium, zinc, barium, potassium, chromium, and iron. Buildings are crumbling, pants are dropping as ceramic belt-buckles disintegrate—"

"It means chaos!" protested Alen.

"It means civilization and peace. An ugly clash was in the making. Blackbeard paused and added deliberately: "Where neither their property nor their honor is touched, most men live content."

"The Prince', Chapter 19. You are—"

"There was another important purpose to the voyage," said the trader, grinning. "You will be interested in this." He handed Alen a document which, unfolded, had the seal of the College and Order at its head.

Alen read in a daze: "Examiner 19 to the Rector—final clearance of Novice—"

He lingered pridefully over the paragraph that described how he had "with coolness and great resource" foxed the battle cruiser of the Realm, "adapting himself readily in a delicate situation requiring not only physical courage but swift recall, evaluation and application of a minor planetary culture."

Not so pridefully he read: "—inclined towards pomposity of manner somewhat ludicrous in one of his years, though not unsuccessful in dominating the crew by his bearing—"

And: "—highly profitable disposal of our gems; a feat of no mean impor-

tance since the College and Order must, after all, maintain itself."

And: "—cleared the final and crucial hurdle with some mental turmoil if I am any judge, but did clear it. After some twenty years of indoctrination in unrealistic non-violence, the youth was confronted with a situation where nothing but violence would serve, correctly evaluated this, and applied violence in the form of a truncheon to the head of a Lyran signal officer, thereby demonstrating an ability to learn and common sense as precious as it is rare."

And, finally, simply: "Recommended for training."

"Training?" gasped Alen. "You mean there's more?"

"Not for most, boy. Not for most. The bulk of us are what we seem to be: oily, gun-shy, indispensable adjuncts to trade who feather our nest with percentages. We need those percentages and we need gun-shy Heralds."

Alen recited slowly: "Among other evils which being unarmed brings you, it causes you to be despised."

"Chapter 14," said blackbeard mechanically. "We leave such clues lying by their bedsides for twenty years, and they never notice them. For the few of us who do — more training."

"Will I learn to throw a knife like you?" asked Alen, repelled and fascinated at once by the idea.

"On your own time, if you wish. Mostly it's ethics and morals so you'll

be able to weigh the values of such things as knife-throwing."

"Ethics! Morals!"

"We started as missionaries, you know."

"Everybody knows that. But the Great Utilitarian Reform —"

"Some of us," said blackbeard dryly. "think it was neither great, nor utilitarian, nor a reform."

It was a staggering idea. "But we're spreading utilitarian civilization!" protested Alen. "Or if we're not, what's the sense of it all?"

Blackbeard told him: "We have our different motives. One is a sincere utilitarian; another is a gambler — happy when he's in danger and his pulses are pounding. Another is proud and likes to trick people. More than a few conceive themselves as servants of mankind. I'll let you rest for a bit now." He rose.

"But you?" asked Alen hesitantly.

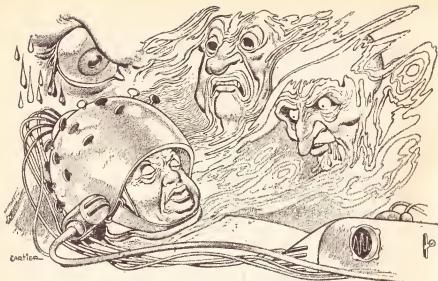
"Me? You will find me in Chapter Twenty-Six," grinned blackbeard. "And perhaps you'll find someone else." He closed the door behind him.

Alen ran through the chapter in his mind, puzzled, until — that was it.

It had a strange and inevitable familiarity to it as if he had always known that he would be saying it aloud, welcomingly, in this cramped cubicle aboard a battered starship:

"God is not willing to do everything, and thus take away our free will and that share of glory which belongs to us."

THE END



THE ANALOGUES

BY DAMON KNIGHT

Illustrated by Cartier

A very interesting technique indeed, to block antisocial actions, as determined of course by the "society." Very neat and effective. But no segment of society is so important to that society's progress as the "antisocial" rebel, the innovator . . .

The creature was like an eye, a globular eye that could see in all directions, encysted in the gray, cloudy mind that called itself Alfie Strunk. In that dimness thoughts squirmed, like dark fish darting; and the eye followed them without pity.

It knew Alfie, knew the evil in

Alfie; the tangled skein of impotence and hatred and desire; the equation: Love equals death. The roots of that evil were beyond its reach; it was only an eye. But now it was changing. Deep in its own center, little electric tingles came and went. Energy found a new gradient, and flowed.

A thought shone in the gray cloud that was Alfie—only half-formed, but unmistakable. And a channel opened. Instantly, the eye thrust a filament of itself into the passage.

Now it was free. Now it could act.

The man on the couch stirred and moaned. The doctor, who had been whispering into his ear, drew back and watched his face. At the other end of the couch, the technician glanced alertly at the patient, then turned again to his meters.

The patient's head was covered to the ears by an ovoid shell of metal. A broad strap of webbing, buckled under his jaw, held it securely. The heads of screw-clamps protruded in three circles around the shell's circumference, and a thick bundle of insulated wires issued from its center, leading ultimately to the control board at the foot of the couch.

The man's gross body was restrained by a rubber sheet, the back of his head resting in the trough of a rubber block fixed to the couch.

"No!" he shouted suddenly. He mumbled, his loose features contorting. Then, "I wasn't gonna—No! Don't—" He muttered again, trying to move his body, the tendons in his neck sharply outlined. "*Please,*" he said, and tears glittered in his eyes.

The doctor leaned forward and whispered in his ear. "You're going away from there. You're going away. It's five minutes later."

The patient relaxed and seemed to be asleep. A teardrop spilled over and ran slowly down his cheek.

The doctor stood up and nodded to the technician, who slowly moved his rheostat to zero before he cut the switches. "A good run," the doctor mouthed silently. The technician nodded and grinned. He scribbled on a pad, "Test him this aft.?" The doctor wrote, "Yes. Can't tell till then, but think we got him solid."

Alfie Strunk sat in the hard chair and chewed rhythmically, staring at nothing. His brother had told him to wait here while he went down the hall to see the doctor. It seemed to Alfie that he had been gone a long time.

Silence flowed around him. The room he sat in was almost bare—the chair he sat in, the naked walls and floor, a couple of little tables with books on them. There were two doors; one, open, led into the long bare hall outside. There were other doors in the hall, but they were all closed and their windows were dark. At the end of the hall was a door, and that was closed, too. Alfie had heard his brother close it behind him, with a solid click, when he left. He felt very safe and alone.

He heard something, a faint echo of movement, and turned his head swiftly, automatically. The noise came from beyond the second door in the room, the one that was just slightly ajar. He heard it again.

He stood up cautiously, not making a sound. He tiptoed to the door, looked through the crack. At first he saw nothing; then the footsteps came again and he saw a flash of color: a blue print skirt, a white sweater, a glimpse of coppery hair.

Alfie widened the crack, very carefully. His heart was pounding and his breath was coming faster. Now he could see the far end of the room. A couch, and the girl sitting on it, opening a book. She was about eleven, slender and dainty. A reading lamp by the couch gave the only light. She was alone.

Alfie's blunt fingers went into his trousers pocket and clutched futilely. They had taken his knife away. Then he glanced at the little table beside the door, and his breath caught. There it was, his own switchblade knife, lying beside the books. His brother must have left it there and forgotten to tell him.

He reached for it—

And an angry female voice said, "*ALFIE!*"

He whirled, cringing. His mother stood there, towering twice his height, with wrath in her staring gray eyes, every line of her so sharp and real that he could not doubt her—though he knew she had been dead these fifteen years.

She had a willow switch in her hand.

"No!" gasped Alfie, retreating to the wall. "Don't—I wasn't gonna do nothing."

She raised the switch. "You're no good, no good, no *good*," she spat. "You've got the devil in you, and it's just got to be whipped out."

"Don't, *please*—" said Alfie. Tears leaked out of his eyes.

"Get away from that girl," she said, advancing. "Get clean away and don't ever go back. Go on—"

Alfie turned and ran, sobbing in his throat.

In the next room, the girl went on reading until a voice said, "O.K., Rita. That's all."

She looked up. "Is that *all*? Well, I didn't do much."

"You did enough," said the voice. "We'll explain to you what it's all about some day. Come on, let's go."

She smiled, stood up—and vanished as she moved out of range of the mirrors in the room below. The two rooms where Alfie had been tested were empty. Alfie's mother was already gone—gone with Alfie, inside his mind where he could never escape her again, as long as he lived.

Martyn's long, cool fingers gently pressed the highball glass. The glass accepted the pressure, a very little; the liquid rose almost imperceptibly inside it. This glass would not break, he knew; it had no hard edges and if thrown it would not hurt anybody much. It was a symbol, perhaps; but only in the sense that nearly everything around him was a symbol.

The music of the five-piece combo

down at the end of the long room was like a glass—muted, gentle, accommodating. And the alcohol content of the whisky in his drink was twenty-four point five per cent.

But men still got drunk, and men still reached instinctively for a weapon to kill.

And, incredibly, there were worse things that could happen. The cure was sometimes worse than the disease. "The operation was successful, but the patient died." We're witch doctors, he thought. We don't realize it yet, most of us, but that's what we are. The doctor who only heals is a servant; but the doctor who controls the powers of life and death is a tyrant.

The dark little man across the table had to be made to understand that. Martyn thought he could do it. The man had power—the power of millions of readers, of friends in high places—but he was a genuine, not a professional, lover of democracy.

Now the little man raised his glass, tilted it in a quick, automatic gesture. Martyn saw his throat pulse, like the knotting of a fist, as he swallowed. He set the glass down, and the soft rosy light from the bar made dragons' eyes of his spectacles.

"Well, Dr. Martyn?" he said. His voice was crisp and rapid, but amiable. This man lived with tension; he was acclimated to it, like a swimmer in swift waters.

Martyn gestured with his glass, a

slow, controlled movement. "I want you to see something first," he said. "Then we'll talk. I asked you to meet me here for two reasons. One is that it's an out-of-the-way place; and, as you'll understand, I have to be careful. The other has to do with a man who comes here every night. His name is Ernest Fox; he's a machinist, when he works. Over there at the bar. The big man in the checkered jacket. See him?"

The other flicked a glance that way; he did not turn his head. "Yeah. The one with the snootful?"

"Yes. You're right, he's very drunk. I don't think it will take much longer."

"How come they serve him?"

"You'll see in a minute," Martyn said.

Ernest Fox was swaying slightly on the bar stool. His choleric face was flushed, and his nostrils widened visibly with each breath he took. His eyes were narrowed, staring at the man to his left—a wizened little fellow in a big fedora.

Suddenly he straightened and slammed his glass down on the bar. Liquid spread over the surface in a glittering flood. The wizened man looked up at him nervously. Fox drew his fist back.

Martyn's guest had half-turned in his seat. He was watching, relaxed and interested.

The big man's face turned abruptly as if someone had spoken to him. He

stared at an invisible something six inches away; and his raised arm slowly dropped. He appeared to be listening. Gradually his face lost its anger and became sullen. He muttered something, looking down at his hands. He listened again. Then he turned to the wizened man and spoke, apparently in apology; the little man waved his hand as if to say, "Forget it," and turned back to his drink.

The big man slumped again on the bar stool, shaking his head and muttering. Then he scooped up his change from the bar, got up and walked out. Someone else took his place almost immediately.

"That happens every night, like clockwork," said Martyn. "That's why they serve him. He never does any harm, and he never will. He's a good customer."

The dark little man was facing him alertly once more. "And?"

"A year and a half ago," Martyn said, "no place in the Loop would let him in the door, and he had a police record as long as your arm. He liked to get drunk, and when he got drunk he liked to start fights. Compulsive. No cure for it, even if there were facilities for such cases. He's *still* incurable. He's just the same as he was—just as manic, just as hostile. But—he doesn't cause any trouble now."

"All right, doctor, I check to you. Why not?"

"He's got an analogue," said Mar-

tyn. "In the classical sense, he is even less sane than he was before. He has auditory, visual and tactile hallucinations—a complete, integrated set. That's enough to get you entry to most institutions, crowded as they are. But, you see, these hallucinations are pre-societal. They were put there, deliberately. He's an acceptable member of society, *because* he has them."

The dark man looked interested and irritated at the same time. He said, "He sees things. What does he see, exactly, and what does it say to him?"

"Nobody knows that except himself. A policeman, maybe, or his mother as she looked when he was a child. Someone whom he fears, and whose authority he acknowledges. The subconscious has its own mechanism for creating these false images; all we do is stimulate it—it does the rest. Usually, we think, it just warns him, and in most cases that's enough. A word from the right person at the right moment is enough to prevent ninety-nine out of a hundred crimes. But in extreme cases, the analogues can actually oppose the patient physically—as far as he's concerned, that is. The hallucination is complete, as I told you."

"Sounds like a good notion."

"A very good notion—rightly handled. In another ten years it will cut down the number of persons institutionalized for insanity to the point where we can actually hope to

make some progress, both in study and treatment, with those that are left."

"Sort of personal guardian angel, tailored to fit," said the dark man.

"That's exactly it," said Martyn. "The analogue always fits the patient because it *is* the patient—a part of his own mind, working against his conscious purposes whenever they cross the prohibition we lay down. Even an exceptionally intelligent man can't defeat his analogue, because the analogue is just as intelligent. Even knowing you've had the treatment doesn't help, although ordinarily the patient doesn't know. The analogue, to the patient, is absolutely indistinguishable from a real person—but it doesn't have any of a real person's weaknesses."

The other grinned. "Could I get one to keep me from drawing to inside straights?"

Martyn did not smile. "That isn't quite as funny as it sounds," he said. "There's a very real possibility that you could, about ten years from now. And that's precisely the catastrophe that I want you to help prevent."

The tall, black-haired young man got out of the pickup and strolled jauntily into the hotel lobby. He wasn't thinking about what he was going to do; his mind was cheerfully occupied with the decoration of the enormous loft he had just rented on the lower East Side. It might be better, he thought, to put both couches

along one wall, and arrange the bar opposite. Or put the *Capcharl* there, with an easy-chair on either side.

The small lobby was empty except for the clerk behind his minuscule desk and the elevator operator lounging beside the cage. The young man walked confidently forward.

"Yes, sir?" said the clerk.

"Listen," said the young man, "there's a man leaning out of a window upstairs, shouting for help. He looked sick."

"What? Show me."

The clerk and the elevator operator followed him out to the sidewalk. The young man pointed to two open windows. "It was one of those, the ones in the middle on the top floor."

"Thanks, mister," said the clerk.

The young man said, "Sure," and watched the two men hurry into the elevator. When the doors closed behind them, he strolled in again and watched the indicator rise. Then, for the first time, he looked down at the blue carpet that stretched between elevator and entrance. It was almost new, not fastened down, and just the right size. He bent and picked up the end of it.

"Drop it," said a voice.

The young man looked up in surprise. It was the man, the same man that had stopped him yesterday in the furniture store. Was he being followed?

He dropped the carpet. "I thought I saw a coin under there," he said.

"I know what you thought," the man said. "Beat it."

The young man walked out to his pickup and drove away. He felt chilly inside. Suppose this happened *every* time he wanted to take something—?

The dark man looked shrewdly at Martyn. He said, "All right, doctor. Spill the rest of it. Let's have it all, not just the background. I'm not a science reporter, you know."

"The Institute," Martyn said, "has already arranged for a staff of lobbyists to start working for the first page of its program when the world legislature returns to session this fall. Here's what they want for a beginning:

"One, analogue treatment for all persons convicted of crime 'while temporarily insane,' as a substitute for either institutionalization or punishment. They will argue that society's real purpose is to prevent the repetition of the crime, not to punish."

"They'll be right," said the little man.

"Of course. But wait. Second, they want government support for a vast and rapid expansion of analogue services. The goal is to restore useful citizens to society, and to ease pressure on institutions, both corrective and punitive."

"Why not?"

"No reason why not—if it would stop there. But it won't." Martyn took a deep breath and clasped his

long fingers together on the table. It was very clear to him, but he realized that it was a difficult thing for a layman to see—or even for a technically competent man in his own field. And yet it was inevitable, it was going to happen, unless he stopped it.

"It's just our bad luck," he said, "that this development came at this particular time in history. It was only thirty years ago, shortly after the third world war, that the problem of our wasted human resources really became so acute that it couldn't be evaded any longer. Since then we've seen a great deal of progress, and public sentiment is fully behind it. New building codes for big cities. New speed laws. Reduced alcoholic content in wine and liquor. Things like that. The analogue treatment is riding the wave.

"It's estimated by competent men in the field that the wave will reach its maximum about ten years from now. And that's when the Institute will be ready to put through the second stage of its progress. Here it is:

"One, analogue treatment against crimes of violence to be compulsory for *all* citizens above the age of seven."

The dark man stared at him. "Blue balls of fire," he said. "Will it work, on that scale?"

"Yes. It will completely eliminate any possibility of a future war, and it will halve our police problem."

The dark man whistled. "Then what?"

"Two," said Martyn, "analogue treatment against speculation, collusion, bribery, and all the other forms of corruption to be compulsory for all candidates for public office. And that will make the democratic system fool-proof, for all time."

The dark man laid his pencil down. "Dr. Martyn," he said, "you're confusing me. I'm a libertarian, but there's *got* to be some method of preventing this race from killing itself off. If this treatment will do what you say it will do, I don't care if it does violate civil rights. I want to go on living, and I want my grandchildren—I have two, by the way—to go on living. Unless there's a catch you haven't told me about this thing, I'm for it."

Martyn said earnestly, "This treatment is a crutch. It is not a therapy, it does not cure the patient of anything. As a matter of fact, as I told you before, it makes him less nearly sane, not more. The causes of his irrational or antisocial behavior are still there, they're only repressed—temporarily. They can't ever come out in the same way, that's true; we've built a wall across that particular channel. But they will express themselves in some other way, sooner or later. When a dammed-up flood breaks through in a new place, what do you do?"

"Build another levee."

"Exactly," said Martyn. "And after that? Another, and another, and another—"

"It's basically wrong!"

Nicholas Dauth, cold sober, stared broodingly at the boulder that stood on trestles between the house and the orchard. It was a piece of New England granite, marked here and there with chalk lines.

It had stood there for eight months, and he had not touched a chisel to it.

The sun was warm on his back. The air was still; only the occasional hint of a breeze ruffled the treetops. Behind him he could hear the clatter of dishes in the kitchen, and beyond that the clear sounds of his wife's voice.

Once there had been a shape buried in the stone. Every stone had its latent form, and when you carved it, you felt as if you were only helping it to be born.

Dauth could remember the shape he had seen buried in this one: a woman and child—the woman kneeling, half bent over the child in her lap. The balancing of masses had given it grace and authority, and the free space had lent it movement.

He could remember it; but he couldn't see it any more.

There was a quick, short spasm in his right arm and side, painful while it lasted. It was like the sketch of an action: turning, walking to where there was whisky—meeting the guard who wouldn't let him drink it, turning away again. All that had squeezed itself now into a spasm, a kind of tic. He didn't drink now, didn't try to drink. He dreamed about it, yes,

thought of it, felt the burning ache in his throat and guts. But he didn't try. There simply wasn't any use.

He looked back at the unborn stone, and now, for an instant, he could not even remember what its shape was to have been. The tic came again. Dauth had a feeling of pressure building intolerably inside him, of something restrained that demanded exit.

He stared toward the stone, and saw its form drift away slowly into an inchoate gray sea; then nothing.

He turned stiffly toward the house. "Martha!" he called.

The clatter of the dishware answered him.

He stumbled forward, holding his arms away from his body. "Martha!" he shouted. "*I'm blind!*"

"Correct me if I'm wrong," said the dark man. "It seems to me that you'd only run into trouble with the actual mental cases, the people who really have strong complications. And, according to you, those are the only ones who should get the treatment. Now, the average man doesn't have any compulsion to kill, or steal, or what have you. He may be tempted to, once in his life. If somebody stops him, that one time, will it do him any harm?"

"For a minute or two, he will have been insane," said Martyn. "But I agree with you that if that were the end of it, no great harm would be

done. At the Institute, the majority believe that that will be the end of it. They're wrong, they're tragically wrong. Because there's one provision that the Institute hasn't included in its program, but that would be the first thought of any lawmaker in the world. *Treatment against any attempt to overthrow the government.*"

The dark man sat silent.

"And from there," said Martyn, "it's only one short step to a tyranny that will last till the end of time."

The other nodded. "You're right," he said. "You are so right. What do you want me to do?"

"Raise funds," said Martyn. "At present the Institute is financed almost entirely by the members themselves. We have barely enough to operate on a minimum scale, and expand very slowly, opening one new center a year. Offer us a charitable contribution—tax-deductible, remember—of half a million, and we'll grab it. The catch is this: the donors, in return for such a large contribution, ask the privilege of appointing three members to the Institute's board of directors. There will be no objection to that, so long as my connection with the donation is kept secret, because three members will not give the donors control. But it will give me a majority on this one issue—the second stage of the Institute's program.

"This thing is like an epidemic. Give it a few years, and nothing can stop it. But act now, and we can

scotch it while it's still small enough to handle."

"Good enough," said the dark man. "I won't promise to hand you half a million tomorrow, but I know a few people who might reach into their pockets if I told them the score. I'll do what I can. I'll get you the money if I have to steal it. You can count on me."

Martyn smiled warmly, and caught the waiter as he went by. "No, this is mine," he said, forestalling the little man's gesture. "I wonder if you realize what a weight you've taken off my shoulders?"

He paid, and they strolled out into the warm summer night. "Incidentally," Martyn said, "there's an answer to a point you brought up in passing—that the weakness of the treatment applies only to the genuinely compulsive cases, where it's most needed. There are means of getting around that, though not of making the treatment into a therapy. It's a crutch and, that's all it will ever be. But for one example, we've recently worked out a technique in which the analogue appears, not as a guardian but as the object of the attack—when

there is an attack. In that way, the patient relieves himself instead of being further repressed, but he still doesn't harm anybody but a phantom."

"It's going to be a great thing for humanity," said the little man seriously, "instead of the terrible thing it might have been except for you, Dr. Martyn. Good night!"

"Good night," said Martyn gratefully. He watched the other disappear into the crowd, then walked toward the El. It was a wonderful night, and he was in no hurry.

The waiter whistled under his breath, as unconscious of the conflicting melody the band was playing as he was of the air he breathed. Philosophically, he picked up the two untouched drinks that stood at one side of the table and drained them one after the other.

If a well-dressed, smart-looking guy like that wanted to sit by himself all evening, talking and buying drinks for somebody who wasn't there, was there any harm in it?

No harm at all, the waiter told himself.

THE END



TELEK

BY JACK VANCE

If a group has a Power not possessed by all men, they will inevitably become an aristocracy. And an aristocracy, having no competing peers, just as inevitably . . .

Illustrated by van Donger

I.

Geskamp and Shorn stood in the sad light of sundown, high on the rim of the new stadium. Wooded hills rolled away to either side; behind them, far to the west, the towers of Tran cut sword-shaped notches into the sky.

Geskamp pointed east, up Swanscomba Valley, now glowing a thousand tones of gold and green in the long light of sunset. "That's where I was born, by that row of poplars. I knew the valley well in the old days." He spent a moment in far reflection. "I hate to see the changes, the old things wiped out. There"—he pointed—

"by the stream was Pimssi's croft and stone barn. There, where you see the grove of oaks, that was the village Cobent. There, by Poll Point, was the valley power tank. There, the Tran aquaport crossed the river, entered the tunnel. It was considered beautiful, the aquaport, antique, overgrown with ivy, stained with lichen. And only six months ago; already it seems a hundred years."

Shorn, intending to make a delicate request, considered how best to take advantage of Geskamp's nostalgia for the irretrievable past; he was faintly surprised to find Geskamp, a big jut-faced man with gray-blond hair, indulging in sentiment of any kind. "There is certainly no recognizing it now."

"No. It's all tidy and clean. Like a park. Look up that mile of clear lawn. I liked it better in the old days. Now it's waste, nothing else." Geskamp cocked his bristling eyebrows at Shorn. "Do you know, they hold me responsible, the farmers and villagers? Because I'm in charge, I gave the orders?"

"They strike out at what's closest."

"I merely earn my salary. I did what I could for them. Completely useless, of course; there never were people so obdurate as the Teleks. Level the valley, build a stadium. Hurry, in time for their midsummer get together. I say, why not build in Mismarch Valley, around the mountain, where only sheepherders would be disturbed, no crofts and farms to be broken up,

no village to be razed."

"What did they say to that?"

"It was Forence Nollinrude I spoke to; you know him?"

"I've seen him: one of their liaison committee. A young man, rather more lofty than the average."

Geskamp spat on the concrete under his feet. "The young ones are the worst. He asked, 'Do we not give you enough money? Pay them well, clear them out. Swanscomba Valley is where we will have our stadium.' So"—Geskamp held out his hands in a quick gesticulation—"I bring out my machines, my men. We fly in material. For those who have lived here all their lives there is no choice; they take their money and go. Otherwise some morning perhaps they look out their door and find polar ice or mountains of the moon. I'd not put such refinement past the Teleks."

"Strange tales are told," Shorn agreed.

Geskamp pointed to the grove of oaks. His shadow, cast against the far side of the stadium by the level rays of the sun, followed the motion. "The oaks they brought, so much did they condescend. I explained that transplanting a forest was a job of great delicacy and expense. They were indifferent. 'Spend as much as you like.' I told them there wasn't enough time, if they wanted the stadium inside the month; finally they were aroused. Nollinrude and the one called Henry Motch stirred themselves, and

the next day we had all our forest—
But would they dispose of the waste
from the aquaport, cast it in the sea?
No. 'You hire four thousand men, let
them move the rubble, brick by brick
if need be; we have business elsewhere.'
And they were gone."

"A peculiar people."

"Peculiar?" Geskamp gathered his
bushy eyebrows into arches of vast
scorn. "Madmen. For a whim—a town
erased, men and women sent forth
homeless." He waved his hand around
the stadium. "Two hundred million
crowns spent to gratify irresponsible
popinjays whose only—"

A droll voice above them said, "I
hear myself bespoken."

The two men jerked around. A man
stood in the air ten feet above them.
His face was mercurial and light-
hearted; a green cap hung waggishly
to the side of his head; dark hair hung
below, almost to his shoulders. He
wore a flaring red cape, tight green
trousers, black velvet shoes. "You
speak in anger, with little real con-
sideration. We are your benefactors;
where would you be without us?"

"Living normal lives," growled
Geskamp.

The Telek was disposed to facetious-
ness. "Who is to say that yours is a
normal life? In any event, our whim
is your employment; we formulate our
idle dreams, you and your men enrich
yourselves fulfilling them, and we're
both the better for it."

"Somehow the money always ends
up back with the Teleks. A mystery."

"No, no mystery whatever. It is the
exercise of economic law. In any event,
we procure the funds, and we would be
fools to hoard. In our spending you
find occupation."

"We would not be idle otherwise."

"Perhaps not. Perhaps . . . well,
look." He pointed across the stadium
to the shadows on the far wall. "Per-
haps there is your bent." And as they
watched, their shadows became active.
Shorn's shadow bent forward, Ges-
kamp's shadow drew back, aimed and
delivered a mighty kick, then turned,
bent, and Shorn's shadow kicked.

The Telek cast no shadow.

Geskamp snorted, Shorn smiled
grimly. They looked back overhead,
but the Telek had moved high and
was drifting south.

"Offensive creature," said Geskamp.
"A law should be passed confiscating
their every farthing."

Shorn shook his head. "They'd have
it all back by nightfall. That's not
the answer." He hesitated, as if about
to add something further.

Geskamp, already irked by the
Telek, did not take the contradic-
tion kindly. Shorn, an architectural
draughtsman, was his subordinate. "I
suppose you know the answer?"

"I know several answers. One of
them is that they should all be killed."

Geskamp's irritation had never car-
ried him quite so far. Shorn was a
strange unpredictable fellow. "Rather

bloodthirsty," he said heavily.

Shorn shrugged. "It might be best in the long run."

Geskamp's eyebrows lowered into a straight bar of gold-gray bristle across his face. "The idea is impractical. The creatures are hard to kill."

Shorn laughed. "It's more than impractical—it's dangerous. If you recall the death of Vernisaw Knerwig—"

Vernisaw Knerwig had been punctured by a pellet from a high-power rifle, fired from a window. The murderer, a wild-eyed stripling, was apprehended. But the jail had not been tight enough to keep him. He disappeared. For months misfortune dogged the town. Poison appeared in the water supply. A dozen fires roared up one night. The roof of the town school collapsed. And one afternoon a great meteor struck down from space and obliterated the central square.

"Killing Teleks is dangerous work," said Geskamp. "It's not a realistic thought. After all," he said hurriedly, "they're men and women like ourselves; nothing illegal has ever been proved."

Shorn's eyes glittered. "Illegality? When they dam the whole stream of human development?"

Geskamp frowned. "I'd hardly say—"

"The signs are clear enough when a person pulls his head up out of the sand."

The conversation had got out of hand; Geskamp had been left behind.

Waste and excess he admitted, but there were so few Teleks, so many ordinary people; how could they be dangerous? It was strange talk for an architect. He looked sidewise in cautious calculation.

Shorn was faintly smiling. "Well, what do you make of it?"

"You take an extreme position. It's hardly conceivable—"

"The future is unknown. Almost anything is conceivable. We might become Teleks, all of us. Unlikely? I think so myself. The Teleks might die out, disappear. Equally unlikely. They've always been with us, all of history, latent in our midst. What are the probabilities? Something like the present situation, a few Teleks among the great mass of common people?"

Geskamp nodded. "That's my opinion."

"Picture the future then. What do you see?"

"Nothing extraordinary. I imagine things will move along much as they have been."

"You see no trend, no curve of shifting relationships?"

"The Teleks are an irritation, certainly, but they interfere very little in our lives. In a sense they're an asset. They spend their money like water; they contribute to the general prosperity." He looked anxiously into the sky through the gathering dusk. "Their wealth, it's honestly acquired; no matter where they find those great

blocks of metal."

"The metal comes from the moon, from the asteroids, from the outer planets."

Geskamp nodded. "Yes, that's the speculation."

"The metal represents restraint. The Teleks are giving value in return for what they could take."

"Of course. Why shouldn't they give value in return?"

"No reason at all. They should. But now—consider the trend. At the outset they were ordinary citizens. They lived by ordinary conventions; they were decent people. After the first congress they made their fortunes by performing dangerous and unpleasant tasks. Idealism, public service was the keynote. They identified themselves with all of humanity, and very praiseworthy, too. Now, sixty years later. Consider the Teleks of today. Is there any pretension to public service? None. They dress differently, speak differently, live differently. They no longer load ships or clear jungles or build roads; they take an easier way, which makes less demands on their time. Humanity benefits; they bring us platinum, palladium, uranium, rhodium, all the precious metals, which they sell at half the old price, and they pour the money back into circulation." He gestured across the stadium. "And meanwhile the old ones are dying and the new Teleks have no roots, no connection with common man. They draw ever

farther away, developing a way of living entirely different from ours."

Geskamp said half-truculently, "What do you expect? It's natural, isn't it?"

Shorn put on a patient face. "That's exactly the point I'm trying to make. Consider the trend, the curve. Where does this 'natural' behavior lead? Always away from common humanity, the old traditions, always toward an elite-herd situation."

Geskamp rubbed his heavy chin. "I think that you're . . . well, making a mountain out of a molehill."

"Do you think so? Consider the stadium, the eviction of the old property-owners. Think of Vernisaw Knerwig and the revenge they took."

"Nothing was proved," said Geskamp uneasily. What was the fellow up to? Now he was grinning, a superior sort of grin."

"In your heart, you agree with what I say; but you can't bring yourself to face the facts—because then you'd be forced to take a stand. For or against."

Geskamp stared out across the valley, wholly angry, but unable to dispute Shorn's diagnosis. "I don't see the facts clearly."

"There are only two courses for us. We must either control the Teleks, that is, make them answerable to human law—or we must eliminate them entirely. In blunt words—kill them. If we don't—they become the masters; we the slaves. It's inevitable."

Geskamp's anger broke surface.

"Why do you tell me all these things? What are you driving at? This is strange talk to hear from an architect; you sound like one of the conspirators I've heard rumors of."

"I'm talking for a specific purpose—just as I worked on this job for a specific purpose. I want to bring you to our way of thinking."

"Oh. So that's the way of it."

"And with this accomplished, recruit your ability and your authority toward a concrete end."

"Who are you? What is this group?"

"A number of men worried by the trend I mentioned."

"A subversive society?" Geskamp's voice held a tinge of scorn.

Shorn laughed. "Don't let the flavor of words upset you. Call us a committee of public-spirited citizens."

"You'd be in trouble if the Teleks caught wind of you," said Geskamp woodenly.

"They're aware of us. But they're not magicians. They don't know who we are."

"I know who you are," said Geskamp. "Suppose I reported this conversation to Nollinrude?"

Shorn grinned. "What would you gain?"

"A great deal of money."

"You'd live the rest of your life in fear of revenge."

"I don't like it," said Geskamp in a brutal voice. "I don't care to be involved in any undercover plots."

"Examine your conscience. Think it over."

II.

The attack on Forence Nollinrude came two days later.

The construction office was a long L-shaped building to the west of the stadium. Geskamp stood in the yard angrily refusing to pay a trucker more than the agreed scale for his concrete aggregate.

"I can buy it cheaper in half a dozen places," roared Geskamp. "You only got the contract in the first place because I went to bat for you."

The trucker had been one of the dispossessed farmers. He shook his head mulishly. "You did me no favor. I'm losing money. It's costing me three crowns a meter."

Geskamp waved an arm angrily toward the man's equipment, a small hopper carried by a pair of ramcopters. "How do you expect to make out with that kind of gear? All your profit goes in running back and forth to the quarry. Get yourself a pair of Samson lifts; you'll cut your costs to where you can make a few crowns."

"I'm a farmer, not a trucker. I took this contract because I had what I have. If I go in the hole for heavy equipment, then I'm stuck with it. It'll do me no more good now, the job's three-quarters done. I want more money, Geskamp, not good advice."

"Well, you can't get it from me."

Talk to the purchasing agent; maybe he'll break down. I got you the contract, that's as far as I go."

"I already talked to the purchasing agent; he said nothing doing."

"Strike up one of the Teleks then; they've got the money. I can't do anything for you."

The trucker spat on the ground. "The Teleks, they're the devils who started this whole thing. A year ago I had my dairy—right where that patch of water is now. I was doing good. Now I've got nothing; the money they gave me to get out, most of it's gone in this gravel. Now where do I go? I got my family."

Geskamp drew his bushy gray-blond eyebrows together. "I'm sorry, Hopson. But there's nothing I can do. There's the Telek now; tell him your troubles."

The Telek was Forence Nollinrude, a tall yellow-haired man, magnificent in a rust cape, saffron trousers, black velvet slippers. The trucker looked across the yard to where he floated a fastidious three feet above the ground, then resolved himself and trudged sullenly forward.

Shorn, inside the office, could hear nothing of the interview. The trucker stared up belligerently, legs spread out. Forence Nollinrude turned himself a little to the side, looked down with distaste deepening the lines at the corners of his mouth.

The trucker did most of the talking. The Telek replied in curt monosylla-

bles, and the trucker became progressively more furious.

Geskamp had been watching with a worried frown. He started across the yard, with the evident intention of calming the trucker. As he approached, Nollinrude pulled himself a foot or two higher, drew slightly away, turned toward Geskamp, motioned toward the trucker, as if requiring Geskamp to remove the annoyance.

The trucker suddenly seized a bar of reinforcing iron, swung mightily.

Geskamp bawled hoarsely; Forence Nollinrude jerked away, but the iron caught him across the shin. He cried in agony, drew back, looked at the trucker. The trucker rose like a rocket, a hundred feet into the air, turned end for end, dived head-first to the ground. He struck with crushing force, pulping his head, his shoulders. But, as if Nollinrude were not yet satisfied, the bar of iron rose and beat the limp body with enormous savage strokes.

Had Nollinrude been less anguished by the pain of his legs he would have been more wary. Almost as the trucker struck the ground, Geskamp seized a laborer's mattock, stalked close behind, swung. The Telek collapsed to the ground.

"Now," said Shorn to himself, "there will be hell to pay."

Geskamp stood panting, looking down at the body huddled in the finery that suddenly seemed not chosen human vestments, but the

gaudy natural growth of a butterfly or flash-beetle in pathetic disarray. He became aware of the mattock he still held, flung it away as if it were red-hot, and stood wiping his hands nervously together.

Shorn knelt beside the body, searched with practised swiftness. He found and pocketed a wallet, a small pouch, then rose to his feet.

"We've got to work fast." He looked around the yard. Possibly half a dozen men had witnessed the occurrence—a tool-room attendant, a form foreman, a couple of time-clerks, a laborer or two. "Get them all together, everyone who saw what happened; I'll take care of the body. Here, you!" He called to a white-faced lift operator. "Get a hopper down here."

They rolled the gorgeous hulk into the hopper. Shorn jumped up beside the operator, pointed. "Up there where they're pouring that abutment."

They swept diagonally up the great north wall, to where a pour-crew worked beside a receptor designed to receive concrete from loaded hoppers. Shorn jumped four feet from the hopper to the deck, went to the foreman. "There's a hold-up here; take your crew down to B-142 Pilaster and work there for a while."

The foreman grumbled, protested. The receptor was half-full of concrete.

Shorn raised his voice impatiently. "Leave it set. I'll send a lift up to move the whole thing."

The foreman turned away, barked ill-naturedly to his men. They moved with exaggerated slowness. Shorn stood tautly while they gathered their equipment and trooped down the ramp.

He turned to the lift operator. "Now."

The bedizened body rolled into the pour.

Shorn guided the dump-hose into position, pulled the trigger. Gray slush pressed down the staring face, that had known so much power.

Shorn sighed slightly. "That's good. Now—we'll get the crew back on the job."

At Pilaster B-142 Shorn signaled the foreman, who glowered belligerently. Shorn was a mere draughtsman, therefore a fumbler and impractical. "You can go back to work up above now."

Before the foreman could find words for an adequate retort, Shorn was back in the hopper.

In the yard he found Geskamp standing at the center of an apprehensive group.

"Nollinrude's gone." He looked at the body of the trucker who had caused the original outburst. "Somebody will have to take him home."

He surveyed the group, trying to gauge their strength, and found nothing to reassure him. Eyes shifted sullenly from his. With an empty feeling in his stomach Shorn knew that the fact of the killing could not be

disposed of as easily as the body.

Shorn once more scanned the surroundings. A great blank wall rose immediately to the east; to the north were the Alban Hills, to the south the empty Swanscomba Valley.

Probably these few people were still alone in their knowledge of the killing. He looked from face to face. "A lot of people to keep a secret. If one of us talks—even to his brother or his friend or his wife—then there's no more secret. You all remember Vernisaw Knerwig?"

A nervous mutter assured him that they did; that their urgent hope was to disassociate themselves from any part of the current episode.

Geskamp's face was working irritably. Shorn remembered that Geskamp was nominally in charge, and was possibly sensitive to any usurpation of his authority. "Yes, Mr. Geskamp? Did you have something to add?"

Geskamp drew back his heavy lips, grinning like a big blond dog. With an effort he restrained himself. "You're doing fine."

Shorn turned back to the others. "You men are leaving the job now. You won't be questioned by any Teleks. Naturally they'll know that Nollinrude has disappeared, but I hope they won't know where. Just in case you are asked—Nollinrude came and went. That's all you know. Another thing." He paused weightily. "If any one of us becomes wealthy

and the Teleks become full of knowledge—this person will regret that he sold his voice." And he added, as if it were an inconsequential matter, "There's a group to cope with situations of this sort." He looked at Geskamp, but Geskamp kept stonily silent. "Now, I'll get your names—for future reference. One at a time—"

Twenty minutes later a carry-all floated off toward Tran.

"Well," said Geskamp bitterly, "I'm up to my neck in it now. Is that what you wanted?"

"I didn't want it this way. You're in a tough spot. So am I. With luck we'll come through. But—just in case—tonight we'll have to do what I was leading up to."

Geskamp squinted angrily. "Now I'm to be your cat's-paw. In what?"

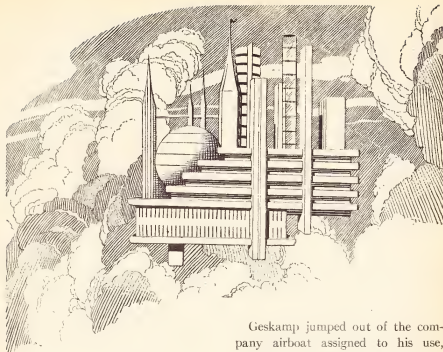
"You can sign a requisition. You can send a pair of lifts to the explosives warehouse—"

Geskamp's bushy eyebrows took on an odd reverse tilt. "Explosives? How much?"

"A ton of mitrox."

Geskamp said in a tone of hushed respect: "That's enough to blow the stadium ten miles high!"

Shorn grinned. "Exactly. You'd better get that requisition off right now. Then you have the key to the generator room. Tomorrow the main pile is going in. Tonight you and I will arrange the mitrox under the piers."



Geskamp's mouth hung open.
"But—"

Shorn's dour face became almost charming. "I know. Wholesale murder. Not sporting. I agree with you. A sneak attack. I agree. Stealth and sneak attacks and back-stabbing are our weapons. We don't have any others. None at all."

"But—why are you so confident of bloodshed?"

Shorn suddenly exploded in anger. "Man, get your head up out of the sand. What's our chance of getting every single one without exception?"

Geskamp jumped out of the company airboat assigned to his use, stalked with a set face around the stadium toward the construction office. Above him rose two hundred feet of sheer concrete, glowing in the morning sun. In his mind's eye Geskamp saw the dark cartons that he and Shorn had carried below like moles on the night previous; he still moving with reluctance and uncertainty, carried only by Shorn's fire and direction.

Now the trap was set. A single coded radio signal would pulverize the new concrete, fling a molten gout miles into the air, pound a gigantic blow at the earth.

Geskamp's honest face became taut as he wrestled with his conscience,

Had he been too malleable? Think what a revenge the Teleks would take for such a disaster! Still, if the Teleks were as terrible a threat to human freedom as Shorn had half made him believe, then the mass killing was a deed to be resolutely carried through, like the killing of dangerous beasts. And certainly the Teleks only paid lip-service to human laws. His mind went to the death of Forence Nollinrude. In ordinary events there would be an inquiry. Nollinrude had killed the trucker; Geskamp, swept by overwhelming rage and pity, had killed the Telek. At the worst a human court would have found him guilty of manslaughter, and no doubt have granted probation. But with a Telek—Geskamp's blood chilled in his veins. Maybe there was something to Shorn's extreme methods after all; certainly the Teleks could be controlled by no normal methods of law.

He rounded the corner of the tool room, noted an unfamiliar face within. Good. Home office had acted without inquisitiveness; the shifting of employees had interested no one with authority to ask questions.

He looked into the expeditor's room. "Where's the draughtsman?" he asked Cole, the steel detailer.

"Never showed up this morning, Mr. Geskamp."

Geskamp cursed under his breath. Just like Shorn, getting him into trouble, then ducking out, leaving him to face it. Might be better to

come clean with the whole incident; after all it had been an accident, a fit of blood-rage. The Teleks could understand so much, surely.

He turned his head. Something flickered at the edge of his vision. He looked sharply. Something like a big black bug whisked up behind a shelf of books. Big cockroach, thought Geskamp. A peculiar cockroach.

He attacked his work in a vicious humor, and foremen around the job asked themselves wonderingly what had got into Geskamp. Three times during the morning he looked into the office for Shorn, but Shorn had made no appearance.

And once, as he ducked under a low soffit on one of the upper decks, a black object darted up behind him. He jerked his eyes around, but the thing had disappeared under the beams.

"Funny bug," he said to the new form foreman, whom he was showing around the job.

"I didn't see it, Mr. Geskamp."

Geskamp returned to the office, obtained Shorn's home address—a hotel in the Marmion Tower—and put in a visiphone call.

Shorn was not in.

Geskamp turned away, almost bumped into the feet of a Telek standing in the air before him: a thin somber man with silver hair and oil-black eyes. He wore two tones of gray, with a sapphire clasp at the collar of his cape, and the usual Telek slippers of

black velvet.

Geskamp's heart started thudding; his hands became moist. The moment he had been dreading. Where was Shorn?

"You are Geskamp?"

"Yes," said Geskamp. "I—"

He was picked up, hurled through the air. Far, fleeting below, went the stadium, Swanscomba Valley, the entire countryside. Tran was a gray and black honeycomb, he was in the sunny upper air, hurtling with unthinkable speed. Wind roared past his ears, but he felt no pressure on his skin, no tear at his clothes.

The ocean spread blue below, and something glittered ahead—a complex edifice of shiny metal, glass and bright color. It floated high in the sunny air, with no support above or below.

Geskamp saw a glitter, a flash; he was standing on a floor of glass threaded and drawn with strands of green and gold. The thin gray man sat behind a table in a yellow chair. The room was flooded with sunlight; Geskamp was too dazed to notice further details.

The Telek said, "Geskamp, tell me what you know of Forence Nollinrude."

It appeared to Geskamp that the Telek was watching him with superior knowledge, as if any lie would be instantly known, dismissed with grim humor. He was a poor liar to begin with. He looked around for a place to rest his big body. A chair appeared.

"Nollinrude?" He seated himself. "I saw him yesterday. What about him?"

"Where is he now?"

Geskamp forced a painful laugh. "How would I know?"

A sliver of glass darted through the air, stung the back of Geskamp's neck. He rose to his feet, startled and angry.

"Sit down," said the Telek, in a voice of unnatural coolness.

Geskamp slowly sat down. A kind of faintness dimmed his vision, his brain seemed to move away, seemed to watch dispassionately.

"Where is Nollinrude?"

Geskamp held his breath. A voice said, "He's dead. Down in the concrete."

"Who killed him?"

Geskamp listened to hear what the voice would say.

III.

Shorn sat in a quiet tavern in that section of Tran where the old suddenly changes to the new. South were the sword-shaped towers, the neat intervening plazas and parks; north spread the ugly crust of three- and four-story apartments gradually blending into the industrial district.

A young woman with straight brown hair sat across the table from Shorn. She wore a brown cloak without ornament; looking into her face there was little to notice but her eyes—large, brown-black, somber; the rest of her

face was without accent.

Shorn was drinking strong tea, his thin dark face in repose.

The young woman seemed to see an indication that the surface calm was false. She put out her hand, rested it on his, a quick exquisite gesture, the first time she had touched him in the three months of their acquaintance. "How could you have done differently?" Her voice became mildly argumentative. "What could you have done?"

"Taken the whole half-dozen underground. Kept Geskamp with me."

"How would that have helped? There'll be a certain number of deaths, a certain amount of destruction—how many and how much is out of our hands. Is Geskamp a valuable man?"

"No. He's a big hard-working likable fellow, hardly devious or many-tracked enough to be of use. And I don't think he would have come with me. He was to the point of open rebellion as it was—the type who resents infringement."

"It's not impossible that your arrangements are effective."

"Not a chance. The only matter for speculation is how many the Teleks destroy and whom."

The young woman relaxed somberly back in her chair, stared straight ahead. "If nothing else, this episode marks a new place in the . . . in the . . . I don't know what to call it. Struggle? Campaign? War?"

"Call it war."

"We're almost out in the open. Public opinion may be aroused, swung to our side."

Shorn shook his head gloomily. "The Teleks have bought most of the police, and I suspect that they own the big newspapers, through fronts of course. No, we can't expect much public support yet. We'll be called Nihilists, Totalitarians—"

The young woman quoted Turgeniev. "If you want to annoy an opponent thoroughly or even harm him, you reproach him with every defect or vice you are conscious of in yourself."

"It's just as well." Shorn laughed bitterly. "Perhaps it's one of our big advantages, our freedom to merge into the masses. If everyone were anti-Telek, the Teleks would have an easy job. Kill everybody."

"Then they'd have to do all their own work."

"That's, right, too."

She made a fluttering gesture, her voice was strained. "It's a blood penance on our century, on humanity—"

Shorn snorted. "Mysticism."

She went on as if she had not heard. "If men were to develop from sub-apes a thousand times—each of those thousand rises would show the same phases, and there would be a Telek phase in all of them. It's as much a part of humanity as hunger and fear and sex."

"And when the Teleks are out of

the way—what's the next phase? Is history only a series of bloody phases? Where's the leveling-off point?"

She smiled wanly. "Perhaps when we're all Teleks."

Shorn gave her a strange look—calculation, curiosity, wonder. He returned to his tea as if to practical reality. "I suppose Geskamp has been trying to get hold of me all morning."

He considered a moment, then rose to his feet. "I'll call the job and find out what's happened."

A moment later he returned. "Geskamp's nowhere around. A message just came in for me at the hotel, and it's to be delivered by hand only."

"Perhaps Geskamp went of his own accord."

"Perhaps."

"More likely—" she paused. "Anyway, the hotel is a good place to stay away from."

Shorn clenched and unclenched his hands. "It frightens me."

"What?" She seemed surprised.

"My own—vindictivness. It's not right to hate anyone. A person is bad because exterior forces have hurt his essentially good brain. I realize this—and yet I hate."

"The Teleks?"

"No, not the Teleks." He spoke slowly. "I fear them, good healthy fear. I kill them for survival. Those I *want* to kill, for pleasure, are the men who serve the Teleks for money, who sell their own kind." He clenched,

unclenched his hands. "It's unhealthy to think like that."

"You're too much the idealist, Will."

Shorn mused, talking in a monotone. "Our war is the war of ants against giants. They have the power—but they loom, we see them for miles. We're among the swarm. We move a hundred feet, into a new group of people, we're lost. Anonymity, that's our advantage. So we're safe—until a Judas-ant identifies us, drags us forth from the swarm. Then we're lost; the giant foot comes down, there's no escape. We—"

The young woman raised her hand. "Listen."

A voice from the sound-line, here running under the ceiling molding, said, "The murder of a Telek, Forence Nollinrude, Liaison lieutenant, by subversive conspiracy has been announced. The murderer, Ian Geskamp, superintendent of construction at the Swanscomba Valley Stadium, has disappeared. It is expected that he will implicate a number of confederates when captured."

Shorn sat quietly.

"What will they do if they catch him? Will they turn him over to the authorities?"

Shorn nodded. "They've announced the murder. If they want to maintain the fiction of their subservience to Federal law, then they've got to submit to the regular courts. Once he's out of their direct custody, then no

doubt he'll die—any one of a number of unpleasant deaths. And then there will be further Acts of God. Another meteor, into Geskamp's home town, something of the sort—"

"Why are you smiling?"

"It just occurred to me that Geskamp's home town was Cobent Village, that used to be in Swanscomba Valley. They've already wiped that one off the map. But they'll do something significant enough to point up the moral—that killing Teleks is a very expensive process."

"It's odd that they bother with legality at all."

"It means that they want no sudden showdown. Whatever revolution there is to be, they want it to come gradually, with as little dislocation as possible, no sudden flood of annoying administrative detail." He sat tapping his fingers nervously. "Geskamp was a good fellow. I'm wondering about this message at the hotel."

"If he were captured, drugged, your name and address would come out. You would be a valuable captive."

"Not while I can bite down on my back tooth. Full of cyanide. But I'm curious about that message. If it's from Geskamp he needs help, and we should help him. He knows about the mitrox under the stadium. The subject might not arise during the course of questioning, especially under drugs, but we don't want to run the risk."

"Suppose it's a trick?"

"Well—we might learn something."

"I could get it," she said doubtfully. Shorn frowned.

"No," she said, "I don't mean by walking in and asking for it; that would be foolish. You write a note authorizing delivery of the message to bearer."

The young woman said to the boy, "It's very important that you follow instructions exactly."

"Yes, miss."

The boy rode the sidewalk to the Marmion Tower, whose seventh and eighth floors were given over to the Cort Hotel. He rode the lift to the seventh floor, went quietly to the desk.

"Mr. Shorn sent me to pick up his mail." He passed the note across the desk.

The clerk hesitated, looked away in preoccupation, then without words handed the boy an envelope.

The boy returned to the ground floor, walked out into the street, where he paused, waited. Apparently no one followed him. He rode the sidewalk north, along the gray streets to the Tarrogat, stepped around the corner, jumped on the high-speed East Division sidewalk. Heavy commercial traffic growled through the street beside him, trucks and drays, a few surface cars. The boy spied a momentary gap, stepped to the outside band, jumped running into the street. He darted across, climbed on the sidewalk running in the opposite direction,

watching over his shoulder. No one followed. He rode a mile, past the Flatiron Y, turned into Grant Avenue, jumped to the stationary, crouched by the corner.

No one came hurrying after.

He crossed the street, entered the Grand Maison Café.

The food panel made an island down the center; to either side were tables. The boy walked around the food panel, ignoring a table where a young woman in a brown cloak sat by herself. He ducked out an entrance opposite to where he entered, rounded the building, entered once more.

The young woman rose to her feet, followed him out. At the exit they brushed together accidentally.

The boy went about his business, and the young woman turned, went back to the rest room. As she opened the door a black beetle buzzed through with her.

She ducked, looked around the ceiling, but the insect had disappeared. She went to a visiphone, paid for sonic, dialed.

"Well?"

"I've got it."

"Anyone follow?"

"No. I watched him leave Marmion Tower. I watched behind him in—" her voice broke off.

"What's the matter?"

She said in a strained voice, "Get out of there fast. Hurry. Don't ask questions. Get away—*fast!*"

She hung up, pretending that she

had not noticed the black bug pressed against the glass, crystal eyes staring at the visiphone dial.

She reached in her pouch, selected one of the four weapons she carried, drew it forth, closed her eyes, snapped the release.

White glare flooded the room, seared behind her closed lids. She ran out the door, picked up the dazed bug in her handkerchief, stuffed it into her pouch. It was strangely heavy, like a slug of lead.

She must hurry. She ran from the rest room, up through the café, out into the street.

Safe among the crowds she watched six emergency vans vomit Black and Golds who rushed to the exits of the Grand Maison Café.

Bitterly she rode the sidewalks north. The Teleks controlled the police, it was no secret.

She wondered about the beetle in her pouch. It evinced no movement, no sign of life. If her supposition were correct, it would be quiet so long as she kept light from its eyes, so long as she denied it reference points.

For an hour she wandered the city, intent on evading not only men, but also little black beetle-things. At last she ducked into a narrow passageway in the hard industry quarter, ran up a flight of wooden steps, entered a drab but neat sitting room.

She went to a closet, found a small cannister with a screw top, gingerly

pushed the handkerchief and the beetle-thing inside, screwed down the lid.

She removed her long brown cloak, drew a cup of coffee from the dispenser, waited.

Half an hour passed. The door opened. Shorn looked in. His face was haggard and pale as a dog skull; his eyes glowed with an unhealthy yellow light.

She jumped to her feet. "What's happened?"

"Sit still, Laurie, I'm all right." He slumped into a seat.

She drew another cup of coffee, passed it to him. "What happened?"

His eyes burnt brighter. "As soon as I heard from you, I left the tavern. Twenty seconds later—no more—the place exploded. Flame shooting out the door, out the windows—thirty or forty people inside; I can hear them yelling now—" His mouth sagged. He licked his lips. "I hear them—"

Laurie controlled her voice. "Just ants."

Shorn assented with a ghastly grin. "The giant steps on forty ants, but the guilty ant, the marked ant, the intended ant—he's gone."

She told him about the black bug. He groaned ironically. "It was bad enough dodging spies and Black and Golds. Now little bugs—Can it hear?"

"I don't know. I suppose so. It's shut up tight in the can, but sound probably gets through."

"We'd better move it."

She wrapped the can in a towel, tucked it in a closet, shut the door. When she returned, Shorn was eying her with a new look in his eye. "You thought very swiftly, Laurie."

She turned away to hide her pleasure. "I had to."

"You still have the message?"

She handed the envelope across the table.

He read, "'Get in touch with Cly-born at the Perendalia.'"

"Do you know him?"

"No. We'll make discreet inquiries. I don't imagine there'll be anything good come out of it."

"It's so much—work."

"Easy for the giants. One or two of them manage the entire project. I've heard that the one called Dominion is in charge, and the others don't even realize there's dissatisfaction. Just as we appoint a dog-catcher, then dismiss the problem of stray dogs from our minds. Probably not one Telek in a hundred realizes that we're fighting for our lives, our futures, our dignity as human beings."

After a moment she asked, "Do you think we'll win, Will?"

"I don't know. We have nothing to lose." He yawned, stretched. "Tonight I meet Circumbright; you remember him?"

"He's the chubby little biophysicist."

Shorn nodded. "If you'll excuse me, I think I'll take a nap."

At eleven o'clock Shorn descended to the street. The sky was bright with glow from the lake-shore entertainment strip, the luxury towers of downtown Tran.

He walked along the dark street till he came to Bellman Boulevard, and stepped out on to the slipway.

There was a cold biting wind and few people were abroad; the hum of the rollers below was noticeable. He turned into Stockbridge Street, and as he approached the quarter-mile strip of night stores, the sidewalks became crowded and Shorn felt more secure. He undertook a few routine precautions, sliding quickly through doors, to break contact with any spy-beetles that might have fixed on him.

At midnight the fog blew thick in from the harbor, smelling of oil, mercaptan, ammonia. Pulling up his hood, Shorn descended a flight of stairs, pushed into a basement recreation hall, sidled past the dull-eyed men at the mechanical games. He walked directly toward the men's room, turned at the last minute into a short side corridor, passed through a door marked "Employees" into a workshop littered with bits and parts from the amusement machines.

Shorn waited a moment, ears alert for sound, then went to the rear of the room, unlocked a steel door, slipped through into a second workshop, much more elaborately fitted

than the first. A short stout man with a big head and mild blue eyes looked up. "Hello, Will."

Shorn waved his hand. "Hello, Gorman."

He stood with his back to the door, looking around the molding for a black, apparently innocent, beetle. Nothing in sight. He crossed the room, scribbled on a bit of paper. "We've got to search the room. Look for a flying spy cell, like this." He sketched the beetle he carried with him in the canister, then appended a postscript. "I'll cover the ventilator."

An hour's search revealed nothing.

Shorn sighed, relaxed. "Ticklish. If there was one of the things here, and it saw us searching, the Telek at the other end would have known the jig was up. We'd have been in trouble. A fire, an explosion. They missed me once already today, by about ten seconds." He set the canister on a bench. "I've got one of the things in here. Laurie caught it; rare presence of mind. Her premise is, that if its eyes and ears are made useless—in other words, if it loses its identity on a spatial frame of reference—then it ceases to exist for the Teleks, and they can no longer manipulate it. I think she's right; the idea seems intuitively sound."

Gorman Circumbright picked up the canister, jiggled it. "Rather heavy. Why did you bring it down here?"

"We've got to figure out a counter to it. It must function like a miniature

video transmitter. I suppose Alvac Corporation makes them. If we can identify the band it broadcasts on, we can build ourselves detectors, warning units."

Circumbright sat looking at the can. "If it's still in operation, if it's still broadcasting, I can find out very swiftly."

He set the can beside an all-wave tuner. Shorn unscrewed the lid, gingerly removed the bug, still wrapped in cloth, set it on the bench. Circumbright pointed to a fluorescent scale, glowing at several points. He started to speak, but Shorn motioned for silence, pointed to the bug. Circumbright nodded, wrote, "The lower lines are possibly static, from the power source. The sharp line at the top is the broadcast frequency—very sharp. Powerful."

Shorn replaced the bug in the can. Circumbright turned away from the tuner. "If it's insensitive to infrared, we can see to take it apart, disconnect the power."

Shorn frowned doubtfully. "How could we be sure?"

"Give it to me." Circumbright clipped leads from an oscillograph to the back of the tuner, dialed to the spy-beetles carrier frequency.

The oscillograph showed a normal sine-curve.

"Now. Turn out the lights."

Shorn threw the switch. The room was dark except for the dancing yellow-green light of the oscillograph

and the dull red murk from the infra-red projector.

Circumbright's bulk cut off the glow from the projector; Shorn watched the oscillograph face. There was no change in the wave.

"Good," said Circumbright. "And I think that if I strain my eyes I can . . . or better, reach in the closet and hand me the heat-conversion lenses. Top shelf."

He worked fifteen minutes, then suddenly the carrier wave on the face of the oscillograph vanished. "Ah," sighed Circumbright. "That's got it. You can turn the lights back on now."

Together they stood looking down at the bug—a little black torpedo two inches long with two crystalline eyes bulging at each side of the head.

"Nice job," said Circumbright. "It's an Alvac product all right. I'll say a word to Graythorne; maybe he can introduce a few disturbing factors."

"What about that detector unit?"

Circumbright pursed his lips. "For each of the bugs there's probably a different frequency; otherwise they'd get their signals mixed up. But the power bank probably radiates about the same in all cases. I can fix up a jury-rig which you can use for a few days, then Graythorne can bring us down some tailor-made jobs from Alvac, using the design data."

He crossed the room, found a bottle of red wine, which he set beside Shorn. "Relax a few minutes."

Half an hour passed. Shorn watched quietly while Circumbright soldered together stock circuits, humming in a continuous tuneless drone.

"There," said Circumbright finally. "If one of those bugs gets within a hundred yards, this will vibrate, thump."

"Good." Shorn tucked the device tenderly in his breast pocket, while Circumbright settled himself into an armchair, stuffed tobacco in a pipe. Shorn watched him curiously. Circumbright, placid and unemotional as a man could be, revealed himself to Shorn by various small signs, such as pressing the tobacco home with a thumb more vigorous than necessary.

"I hear another Telek was killed yesterday."

"Yes. I was there."

"Who is this Geskamp?"

"Big blond fellow. What's the latest on him?"

"He's dead."

"Hm-m-m." Shorn was silent a moment, a sick feeling at the pit of his stomach. "How?"

"The Teleks turned him over to the custody of the Federal Marshal at Knoll. He was shot trying to escape."

Shorn felt as if anger were being pumped inside him, as if he were swelling, as if the pressure against his taut muscles were too great to bear.

"Take it easy," said Circumbright mildly.

"I'll kill Teleks from a sense of duty," said Shorn. "I don't enjoy it."



But . . . and I feel ashamed, I'll admit . . . I *want* to kill the Federal Marshal at Knoll."

"It wasn't the Federal Marshal himself," said Circumbright. "It was two of his deputies. And it's always possible that Geskamp actually did try to escape. We'll know for sure tomorrow."

"How so?"

"We're moving out a little bit. There'll be an example made of those two if they're guilty. We'll narcotize them tonight, find out the truth. If they're working for the Teleks—they'll go." Circumbright spat on the floor. "Although I dislike the label of a terrorist organization?"

"What else can we do? If we got a confession, turned them over to the Section Attorney, they'd be reprimanded, turned loose."

"True enough." Circumbright puffed meditatively.

Shorn moved restlessly in his chair. "It frightens me, the imminence, the urgency of all this—And how few people are aware of it! Surely there's never been an emergency so ill-publicized before. In a week, a month, three months—there'll be more dead people on Earth than live ones, unless we get the entire shooting-match at once in the stadium."

Circumbright puffed at his pipe. "Will, sometimes I wonder whether we're not approaching the struggle from the wrong direction."

"How so?"

"Perhaps instead of attacking the Teleks, we should be learning more of the fundamental nature of telekinetics."

Shorn leaned back fretfully. "The Teleks don't know themselves."

"A bird can't tell you much about aerodynamics. The Teleks have a disadvantage which is not at all obvious—the fact that action comes too easy, that they are under no necessity to think. To build a dam, they look at a mountain, move it down into the valley. If the dam gives way, they move down another mountain, but they never look at a slide rule. In this respect, at least, they represent a retrogression rather than an advance."

Shorn slowly opened and closed his hands, watching as if it were the first time he had ever seen them. "They're caught in the stream of life, like the rest of us. It's part of the human tragedy that there can't be any compromise; it's them or us."

Circumbright heaved a deep sigh. "I've racked my brains . . . Compromise. Why can't two kinds of people live together? Our abilities complement each other."

"One time it was that way. The first generation. The Teleks were still common men, perhaps a little peculiar in that things always turned out lucky for them. Then Joffrey and his Telekinetic Congress, and the reinforcing, the catalysis, the forcing, whatever it was—and suddenly they're different."

"If there were no fools," said Cir-

cumbright, "either among us or among them, we could co-inhabit the earth. There's the flaw in any compromise negotiation—the fact of fools, both among the Teleks and the common men."

"I don't quite follow you."

Circumbright gestured with his pipe. "There will always be Telek fools to antagonize common-man fools; then the common-man fools will ambush the Teleks, and the Teleks will be very upset; especially since for every Telek, there are forty Earth fools eager to kill him. So they use force, terror. Inexorable, inevitable. But—they have a choice. They can leave Earth, find a home somewhere among the planets they claim they visit; they can impose this reign of power; or they can return to humanity, renounce telekinesis entirely. Those are the choices open to them."

"And our choices?"

"We submit or we challenge. In the first instance we become slaves. In the second we either kill the Teleks, drive them away, or we all become dead men."

Shorn sipped at his wineglass. "We might all become Teleks ourselves."

"Or we might find a scientific means to control or cancel out telekinesis." Circumbright poured a careful finger of wine for himself. "My own instinct is to explore the last possibility."

"There's nowhere to get a foothold in the subject."

"Oh I don't know. We have a number of observations. Telekinesis and teleportation have been known for thousands of years. It took the concentration of telekinetics at Joffrey's Congress to develop the power fully. We know that Telek children are telekinetic—whether by contagion or by genetics we can't be sure."

"Probably both. A genetic predisposition; parental training."

Circumbright nodded. "Probably both. Although as you know, in rare instances they reward a common man by making a Telek out of him."

"Evidently telekinesis is latent in everyone."

"There's a large literature of early experiments and observations. The so-called spiritualist study of poltergeists and house-demons might be significant."

Shorn remained silent.

"I've tried to systematize the subject," Circumbright continued, "deal with it logically. The first question seems to be, does the Law of Conservation of Energy apply or not? When a Telek floats a ton of iron across the sky by looking at it, is he creating energy or is he directing the use of energy from an unseen source? There is no way of knowing offhand."

Shorn stretched, yawned, settled back in his chair. "I have heard a metaphysical opinion, to the effect that the Telek uses nothing more than confidence. The universe that he perceives has reality only to the back-

drop of his own brain. He sees a chair; the image of a chair exists in his mind. He orders the chair to move across the room. His confidence and reality is so great that, in his mind, he believes he sees the chair move, and he bases his future actions on the perception. Somehow he is not disappointed. In other words, the chair has moved because he believes he has moved it."

Circumbright puffed placidly on his pipe.

Shorn grinned. "Go on; I'm sorry I interrupted you."

"Where does the energy come from? Is the mind a source, a valve or a remote control? There are the three possibilities. Force is applied; the mind directs the force. But does the force *originate* in the mind, is the force *collected*, *channeled through* the mind, or does the mind act like a modulator, a grid in a vacuum tube?"

Shorn slowly shook his head. "So far we have not even defined the type of energy at work. If we knew that, we might recognize the function of the mind."

"Or vice versa. It works either way. But if you wish, consider the force at work. In all cases, an object moves in a single direction. That is to say, there has been no observed case of an explosion or a compression. The object moves as a unit. How? Why? To say the mind projects a force field is ignoring the issue, redefining at an equal level of abstraction."

"Perhaps the mind is able to control the poltergeists—creatures like the old Persian genii."

Circumbright tapped the ash from his pipe. "I've considered the possibility. Who are the poltergeists? Ghosts? Souls of the dead? A matter for speculation. Why are the Teleks able to control them, and ordinary people not?"

Shorn grinned. "I assume these are rhetorical questions—because I don't have the answers."

"Perhaps a form of gravity is at work. Imagine a cup-shaped gravity screen around the object, open on the side the Telek desires motion. I have not calculated the gravitational acceleration generated by matter at its average universal density, from here to infinity, but I assume it would be insignificant. A millimeter a day, perhaps. Count the cup-shaped gravity-screen out; likewise a method for rendering the object opaque to the passage of neutrinos in a given direction."

"Poltergeists, gravity, neutrinos—all eliminated. What have we left?"

Circumbright chuckled. "I haven't eliminated the poltergeists. But I incline to the Organic Theory. That is, the concept that all the minds and all the matter of the universe are interconnected, much like brain cells and muscular tissue of the body. When certain of these brain cells achieve a sufficiently close vinculum, they are able to control certain twitchings of

the corporeal frame of the universe. How? Why? I don't know. After all, it's only an idea, a sadly anthropomorphic idea."

Shorn looked thoughtfully up at the ceiling. Circumbright was a three-way scientist. He not only proposed theories, he not only devised critical experiments to validate them, but he was an expert laboratory technician. "Does your theory suggest any practical application?"

Circumbright scratched his ear. "Not yet. I need to cross-fertilize it with a few other notions. Like the metaphysics you brought up a few moments ago. If I only had a Telek who would submit himself to experiments, we might get somewhere—And I think I hear Dr. Kurgill."

He rose to his feet, padded to the door. He opened it; Shorn saw him stiffen.

A deep voice said, "Hello, Circumbright; this is my son. Cluche, meet Gorman Circumbright, one of our foremost tacticians."

The two Kurgills came into the laboratory. The father was short, spare, with simian length to his arms. He had a comical simian face with a high forehead, long upper lip, flat nose. The son resembled his father not at all: a striking young man with noble features, a proud crest of auburn hair, an extreme mode of dress, reminiscent of Telek style. The elder was quick of movement, talkative,

warm; the younger was careful of eye and movement.

Circumbright turned toward Shorn. "Will—" he stopped short. "Excuse me," he said to the Kurgills. "If you'll sit down, I'll be with you at once."

He hurried into the adjoining store-room. Shorn stood in the shadows.

"What's the trouble?"

Shorn took Circumbright's hand, held it against the warning unit in his pocket.

Circumbright jerked. "The thing's vibrating!"

Shorn looked warily into the room beyond. "How well do you know the Kurgills?"

Circumbright said, "The doctor's my lifelong friend, I'd go my life for him."

"And his son?"

"I can't say."

They stared at each other, then by common accord, looked through the crack of the door. Cluche Kurgill had seated himself in the chair Shorn had vacated, while his father stood in front of him, teetering comfortably on his toes, hands behind his back.

"I'd swear that no bug slipped past us while I stood in the doorway," muttered Circumbright.

"No. I don't think it did."

"That means it's on one or the other of their persons."

"It might be unintentional—a plant. But how would the Teleks know the Kurgills intended to come down here?"

Shorn shook his head.

Circumbright sighed. "I guess not."

"The bug will be where it can see, but where it can't be seen—or at least, not noticed."

Their glances went to the ornate headdress Cluche Kurgill wore on one side of his head: a soft roll of gray-green leather, bound by a strip across his hair, trailing a dangle of moon-opals past his ear.

Circumbright said in a tight voice, "We can expect destruction at any time. Explosion—"

Shorn said slowly, "I doubt if they'll send an explosion. If they feel they are unsuspected, they'll prefer to bide their time."

Circumbright said huskily, "Well, what do you propose then?"

Shorn hesitated a moment before replying. "We're in a devil of a ticklish position. Do you have a narco-hypnotic stinger handy?"

Circumbright nodded.

"Perhaps then—"

Two minutes later Circumbright rejoined the Kurgills. The old doctor was in a fine humor. "Gorman," he said to Circumbright, "I'm very proud of Cluche here. He's been a scapegrace all his life—but now he wants to make something of himself."

"Good," said Circumbright with hollow heartiness. "If he were of our conviction, I could use him right now—But I wouldn't want him to do anything against his—"

"Oh, no, not at all," said Cluche.

"What's your problem?"

"Well, Shorn just left for a very important meeting—the regional chiefs—and he's forgotten his code book. I couldn't trust an ordinary messenger, but if you will deliver the code book, you'd be doing us a great service."

"Any little thing I can do to help," said Cluche. "I'll be delighted."

His father regarded him with fatuous pride. "Cluche has surprised me. He caught me out just the day before yesterday, and now nothing must do but that he plunges in after me. Needless to say I'm very pleased; glad to see that he's a chip off the old block, nothing stands in his way."

Circumbright said, "I can count on you then? You'll have to follow instructions exactly."

"Quite all right, sir, glad to help."

"Good," said Circumbright. "First thing then—you'll have to change your clothes. You'd be too conspicuous as you are."

"Oh, now!" protested Cluche. "Surely a cloak—"

"No!" snapped Circumbright. "You'll have to dress as a dock worker from the skin out. No cloak would hide that headgear. In the next room you'll find some clothes. Come with me, I'll make a light."

He held open the door; reluctantly Cluche stepped through.

The door closed. Shorn expertly seized Cluche's neck, digging strong fingers into the motor nerves. Cluche stiffened, trembling.

Circumbright slapped the front of his neck with a barbful of drug, then fumbled for Cluche's headdress. He felt a smooth little object bulging with two eyes like a tadpole. He said easily. "Can't seem to find the light—" He tucked the bug into his pouch. "Here it is. Now—your pouch, I'll put it into this locker; it'll be safe till you get back." He winked at Shorn, shoved the pouch into a heavy metal tool chest.

They looked down at the sprawled body. "There's not much time," said Circumbright. "I'll send Kurgill home, and we'll have to get out ourselves." He looked regretfully around the room. "There's a lot of fine equipment here

We can get more, I suppose."

Shorn clicked his tongue. "What will you tell Kurgill?"

"Um-m-m. The truth would kill him."

"Cluche was killed by the Teleks. He died defending the code book. The Teleks have his name; he'll have to go underground himself."

"He'll have to go under tonight. I'll warn him to lay low, say in Capistrano's, until we call him, then we can give him the bad news. As soon as he's gone we'll take Cluche out the back way, to Laurie's."

Cluche Kurgill sat in a chair, staring into space. Circumbright leaned back smoking his pipe. Laurie, in white pajamas and a tan robe, lay sideways on a couch in the corner watching;

Shorn sat beside her.

"How long have you been spying for the Teleks, Cluche?"

"Three days."

"Tell us about it."

"I found some writings of my father's which led me to believe he was a member of a sub-organization. I needed money. I reported to a police sergeant who I knew to be interested. He wanted me to furnish him the details; I refused. I demanded to speak to a Telek. I threatened the policeman—"

"What is his name?"

"Sergeant Cagolian Loo, of the Moxenwohl Precinct."

"Go on."

"Finally he arranged an appointment with Adlari Dominion. I met Dominion at the Pequinate, out in Vireburg. He gave me a thousand crowns and a spy cell which I was to carry with me at all times. When anything interesting occurred I was to press an attention button."

"What were your instructions?"

"I was to become a conspirator along with my father, accompanying him as much as possible. If my efforts resulted in the arrest of important figures, he hinted that I might be made a Telek myself."

"Did he intimate how this metamorphosis is accomplished?"

"No."

"When are you to report to Dominion again?"

"I am to contact him by visiphone

at 2:00 p.m. tomorrow, at Glarietta Pavilion."

"Is there any password or identification code?"

"No."

Silence held the room for several minutes. Shorn stirred, rose to his feet. "Gorman—suppose I were to be metamorphosed, suppose I were to become a Telek."

Circumbright chewed placidly on his pipestem. "It would be a fine thing. I don't quite understand how you'll manage. Unless," he added in a dry voice, "you intend to turn us all in to Adlari Dominion."

"No. But look at Cluche. Look at me."

Circumbright looked, grimaced, straightened up in his seat.

Shorn watched expectantly. "Could it be done?"

"Oh. I see. Give you more nose, a longer chin, fuller cheeks, a lot of red hair—"

"And Cluche's clothes."

"You'd pass."

"Especially if I come with information."

"That's what is puzzling me. What kind of information could you give Dominion that would please him but wouldn't hurt us?"

Shorn told him.

Circumbright puffed on his pipe. "It's a big decision. But it's a good exchange. Unless he's got the same thing already, from other sources."

"Such as Geskamp? In which case,

we lose nothing."

"True." Circumbright went to the visiphone. "Tino? Bring your gear over to—" He looked at Laurie: "What's the address?"

"29, 24, 14 Martinvelt."

V.

The red-haired man moved with a taut wiriness that had not been characteristic of Cluche Kurgill. Laurie inspected him critically.

"Walk slower, Will. Don't flail your arms so. Cluche was very languid."

"Check this." Shorn walked across the room.

"Better."

"Very well. I'm gone. Wish me luck. My first stop is the old workshop for Cluche's spy cell. He'd hardly be likely to leave it there."

"But aren't you taking a chance, going back to the workshop?"

"I don't think so. I hope not. If the Teleks planned to destroy it, they would have done so last night." He waved his hand abruptly and was gone.

He rode the sidewalk, aping the languorous and lofty democracy he associated with Cluche. The morning had been overcast and blustery; with spatters of cold rain, but at noon the clouds broke. The sun surged through gaps in the hurrying rack, and the great gray buildings of Tran stood forth like proud lords. Shorn tilted his head back; this was the grandeur of

simple bulk, but nevertheless impressive. He himself preferred construction on a smaller scale, buildings to suit a lesser number of more highly individualized people. He thought of the antique Mediterranean temples, gaudy in their pinks and green and blues, although now the marble had bleached white. Such idiosyncrasy was possible, even enforced, in the ancient monarchies. Today every man, in theory his own master, was required to mesh with his fellows, like a part in a great gear cluster. The culture-colors and culture-tones came out at the common denominator, the melange of all colors: gray. Buildings grew taller and wider from motives of economy—the volume increased by the cube but the enclosing surface only by the square. The *motif* was utilitarianism, mass policy, each tenant relinquishing edges and fringes of his personality, until only the common basic core—a sound roof, hot and cold water, good light, air-conditioning, and good elevator service—remained.

People living in masses, thought Shorn, were like pebbles on a beach, each grinding and polishing his neighbor until all were absolutely uniform. Color and flair were to be found only in the wilderness and among the Teleks. Imagine a world populated by Teleks; imagine the four thousand expanded to four hundred million, four billion! First to go would be the cities. There would be no more concentrations, no more giant gray build-

ings, no directed rivers of men and women. Humanity would explode like a nova. The cities would corrode and crumble, great mournful hulks, the final monuments to medievalism. Earth would be too small, too limited. Out to the planets, where the Teleks claimed to roam at will. Flood Mars with blue oceans, filter the sky of Venus. Neptune, Uranus, Pluto—call them in, bestow warm new orbits upon them. Bring in even Saturn, so vast and yet with a surface gravity only a trifle more than Earth's—. But these great works, suppose they exhausted the telekinetic energy, wherever it originated? Suppose some morning the Teleks awoke and found the power gone!

Then—the crystal sky-castles falling! Food, shelter, warmth needed, and no secure gray cities, no ant-hill buildings, none of the pedestrian energies of metal and heat and electricity. Then what calamity! What wailing and cursing!

Shorn heaved a deep sigh. Speculation. Telekinetic energy might well be infinite. Or it might be at the point of exhaustion at this moment. Speculation, and not germane to his present goal.

He frowned. Perhaps it was important. Perhaps some quiet circuit in his mind was at work, aligning him into new opinions—

Ahead was the basement recreation hall. Shorn guiltily realized that he had been swinging along at his own

gait, quite out of character with the personality of Cluche Kurgill. Best not forget these details, he told himself guiltily; there would be opportunity for only one mistake.

He descended the stairs, strode through the hall, past the clicking, glowing, humming game machines, where men, rebelling at the predictability of their lives, came to buy synthetic adventure and surprise.

He walked unchallenged through the door marked "Employees"; at the next door he paused, wondering whether he had remembered to bring the key, wondering if a spy cell might be hidden in the shadows, watching the door.

If so, would Cluche Kurgill be likely to possess a key? It was in the bounds of possibility, he decided, and in any event would not be interpreted as suspicious.

Shorn groped into his pouch. The key was there. He opened the door, and assuming the furtive part of a spy, entered the workshop.

It was as they had left it the night before. Shorn went quickly to the tool chest, found Circumbright's pouch, brought forth the bug, set it carefully into his headdress.

Now—get out as fast as possible. He looked at his watch. Twelve noon. At two, Cluche's appointment with Adlari Dominion, chief of the Telek Liaison Committee.

Shorn ate an uncomfortable lunch

in one corner of the Mercantile Mart Foodarium, a low-ceilinged acreage dotted with tables precisely as a tile floor, and served by a three-tier display of food moving slowly under a transparent case. His head itched furiously under the red toupee, and he dared not scratch lest he disturb Tino's elaborate effort. Secondly, he decided that the Foodarium, the noon resort of hurried day-workers, was out of character for Cluche Kurgill. Among the grays and dull greens and browns, his magnificent Telek-style garments made him appear like a flamingo in a chicken-run. He felt glances of dull hostility; the Teleks were envied but respected; one of their own kind aping the Teleks was despised with the animosity that found no release elsewhere.

Shorn ate quickly and departed. He followed Zyke Alley into Multiflores Park, where he sauntered back and forth among the dusty sycamores.

At two he sat himself deliberately in a kiosk, dialed Glarietta Pavilion on the visiphone. The connection clicked home; the screen glowed with a fanciful black-and-white drawing of Glarietta Pavilion, and a terse man's voice spoke. "Glarietta Pavilion."

"I want to speak to Adlari Dominion; Cluche Kurgill calling."

A thin face appeared, inquisitive, impertinent, with a lumpy nose, pale-blue eyes set at a birdlike slant. "What do you want?"

Shorn frowned. He had neglected an

important item of information; it would hardly do to ask the man in the visiphone if he were Adlari Dominion, whom he was supposed to have met three days previously.

"I had an appointment for today at two," and cautiously he watched the man in the screen.

"You can report to me."

"No," said Shorn, now confident. The man was too pushing, too authoritative. "I want to speak to Adlari Dominion. What I have to say is not for your ears."

The thin man glared. "I'll be the judge of that; Dominion can't be bothered every five minutes."

"If Dominion learns that you are standing in my way, he will not be pleased."

The thin face flushed red. His hand swept up, the screen went pale-green. Shorn waited.

The screen lit once more, showing a bright room with high white walls. Windows opened on sun-dazzled clouds. A man, thin as the first to answer the screen, but somber, with gray hair and oil-black eyes, looked quietly at him. Under the bore of the sharp eyes, Shorn suddenly felt uneasy. Would his disguise hold up?"

"Well, Kurgill, what do you have to tell me?"

"It's a face-to-face matter."

"Hardly wise," Dominion commented. "Don't you trust the privacy of the visiphone? I assure you it's not tapped."

"No. I trust the visiphone. But—I stumbled on something big. I want to be sure I get what's coming to me."

"Oh," Dominion made no play at misunderstanding. "You've been working—how long?"

"Three days."

"And already you expect the greatest reward it's in our power to bestow?"

"It's worth it. If I'm a Telek, it's to my advantage to help you. If I'm not—it isn't. Simple as that."

Dominion frowned slightly. "You're hardly qualified to estimate the value of your information."

"Suppose I knew of a brain disease which attacks only Teleks. Suppose I knew that inside of a year half or three-quarters of the Teleks would be dead?"

Dominion's face changed not a flicker. "Naturally I want to know about it."

Shorn made no reply.

Dominion said slowly, "If such is your information, and we authenticate it, you will be rewarded suitably."

Shorn shook his head. "I can't take the chance. This is my windfall. I've got to make sure I get what I'm after; I may not have another chance."

Dominion's mouth tightened, but he said mildly enough, "I understand your viewpoint."

"I want to come up to the Pavilion. But a word of warning to you; there's no harm in clear understanding between friends."

"None whatever."

"Don't try drugs on me. I've got a cyanide capsule in my mouth. I'll kill myself before you get something for nothing."

Dominion smiled grimly. "Very well, Kurgill. Don't execute yourself, swallow it by mistake."

Shorn smiled likewise. "Only as a gesture of protest. How shall I come up to Glarietta?"

"Hire a cab."

"Openly?"

"Why not?"

"You're not afraid of counter-espionage?"

Dominion's eyes narrowed; his head tilted slightly. "I thought we discussed that at our previous meeting."

Shorn took care not to protest his recollection too vehemently. "Very well. I'll be right up."

Glarietta Pavilion floated high above the ocean, a fairy-book cloud-castle—shining white terraces, ranked towers with red and blue parasol roofs, gardens verdant with foliage and vines trailing down into the air.

The cab slid down on a landing flat. Shorn alighted. The driver looked at him without favor. "Want me to wait?"

"No, you can go." Shorn thought wryly, he'd either be leaving under his own power or not be leaving at all.

A door slid back before him; he entered a hall walled with russet orange, purple and green prisms, glow-



ing in the brilliant upper air light. In a raised alcove sat a young woman, a beautiful creature with glossy butter-colored hair, a cream-smooth face.

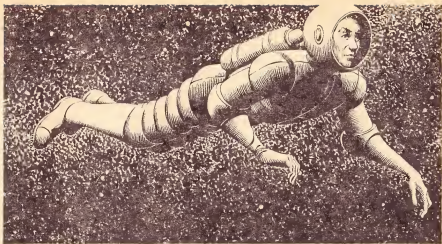
"Yes, sir?" she asked, impersonally courteous.

"I want to see Adlari Dominion. I'm Cluche Kurgill."

She touched a key below her. "To your right."

He climbed a glass staircase which spiraled up a green glass tube, came out in a waiting room walled with gold-shot red rock that had never been quarried on Earth. Dark-green ivy veiled one wall; white columns opposite made a graceful frame into an herbarium full of green light and lush green growth, white and scarlet flowers.

Shorn hesitated, looked around him. A golden light blinked in the wall, an



aperture appeared. Adlari Dominion stood in the opening. "Come in, Kurgill."

Shorn stepped into the wash of light, and for a moment lost Dominion in the dazzle. When vision returned, Dominion was lounging in a hammock-chair supported by a glistening rod protruding horizontally from the wall. A red leather ottoman was the only other article of furniture visible. Three of the walls were transparent glass, giving on a magnificent vista: clouds bathed in sunlight, blue sky, blue sea.

Dominion pointed to the ottoman. "Have a seat."

The ottoman was only a foot high; sitting in it Shorn would be forced to crane his neck to see Dominion.

"No, thanks. I prefer to stand." He put a foot on the ottoman, inspected

Dominion coolly, eye to eye.

Dominion said evenly, "What do you have to tell me?"

Shorn started to speak, but found it impossible to look into the smoldering black eyes and think at the same time. He turned his eyes out the window to a pinnacle of white cloud. "I've naturally considered this situation carefully. If you've done the same . . . as I imagine you have . . . then there's no point in each of us trying to outwit the other. I have information that's important, critically important, to a great number of Teleks. I want to trade this information for Telek status." He glanced toward Dominion whose eyes had never faltered, looked away once more.

"I'm trying to arrange this statement with absolute clarity, so there'll be complete understanding between

us. First, I want to remind you, I have^{*} poison in my mouth. I'll kill myself before I part with what I know, and I guarantee you'll never have another chance to learn what I can tell you." Shorn glanced earnestly sidewise at Dominion. "No hypnotic drug can act fast enough to prevent me from biting open my cyanide—Well, enough of that.

"Second: I can't trust any verbal or written contract you make; if I accepted such a contract I'd have no means to enforce it. You are in a stronger position. If you deliver your part of the bargain, and I fail to deliver my part, you can still arrange that I be . . . well, penalized. Therefore, to demonstrate your good faith, you must make delivery before I do.

"In other words, make me a Telek. Then I'll tell you what I know."

Dominion sat staring at him a full thirty seconds. Then he said softly, "Three days ago Cluche Kurgill was not so rigorous."

"Three days ago, Cluche Kurgill did not know what he knows now."

Dominion said abruptly, "I cannot argue with your exposition. If I were you, in your position, I would make the same stipulation. However"—he looked Shorn keenly up and down—"three days ago I would have considered you an undesirable adjunct."

Shorn assumed a lofty expression. "Judging from the Teleks I have known, I would not have assumed you

to be so critical."

"You talk past your understanding," said Dominion crisply. "Do you think that men like Nollinrude, for instance, who was just killed, are typical of the Teleks? Do you think that we are all careless of our destiny?" His mouth twisted contemptuously. "There are forces at work which you do not know of, tremendous patterns laid out for the future. But enough; these are high-level ideas."

He floated clear of his chair, lowered to the floor. "I agree to your stipulation. Come with me, we'll get it over with. You see, we are not inflexible; we can move swiftly and decisively when we wish."

He led Shorn back into the green glass tube, jerked himself to the upper landing, watched impatiently while Shorn circled up the steps.

"Come." He stepped out on a wide white terrace bathed in afternoon sunlight, went directly to a low table on which rested a cubical block of marble.

He reached into a cabinet under the table, pulled out a small speaker, spoke into the mesh. "The top two hundred to Glarietta Pavilion." He turned beck to Shorn. "Naturally there'll be certain matters you must familiarize yourself with."

"In order to become a Telek, you mean?"

"No, no," snapped Dominion. "That's a simple mechanical matter. Your perspective must be adjusted;

you'll be living with a new orientation toward life."

"I had no idea it was quite so involved."

"There's a great deal you don't understand." He motioned brusquely. "Now to business. Watch that marble block on the table. Think of it as part yourself, controlled by your own nervous impulses. No, don't look around; fix on the marble block. I'll stand here." He took a place near the table. "When I point to the left, move it to the left; when I point to the right, move it to the right. Mind now, the cube is part of your organism, part of your flesh, like your hands and feet."

There was murmuring and a rustle behind Shorn; obedient to Dominion he fastened his eyes on the cube.

"Now." Dominion pointed to the left.

Shorn willed the cube to the left. "The cube is part of you," said Dominion. "Your own body."

Shorn felt a cool tremor at his skin. The cube moved to the left.

Dominion pointed to the right. Shorn willed the cube to the right. The tingling increased. It was as if he were gradually finding himself immersed in cool carbonated water.

Left. Right. Left. Right. The cube seemed to be nearer to him, though he had not moved. As near as his own hand. His mind seemed to break through a tough sphincter into a new medium, cool and wide; he saw the world in a sudden new identity, some-

thing part of himself.

Dominion stepped away from the table; Shorn was hardly conscious that he no longer made directive gestures. He moved the cube right, left, raised it six feet into the air, twenty feet, sent it circling high around the sky. As he followed it with his eyes, he became aware of Teleks standing silently behind him, watching expressionlessly.

He brought the cube back to the table. Now he knew how to do it. He lifted himself into the air, moved across the terrace, set himself down. When he looked around the Teleks had gone.

Dominion wore a cool smile. "You take hold with great ease."

"It seems natural enough. What is the function of the others, the Teleks behind on the terrace?"

Dominion shrugged. "We know little of the actual mechanism. At the beginning, of course, I helped you move the cube, as did the others. Gradually we let our minds rest, and you did it all."

Shorn stretched. "I feel myself the center, the hub, of everything—as far as I can see."

Dominion nodded without interest. "Now—come with me." He sped through the air.—Shorn followed, exulting in his new power and freedom. Dominion paused by the corner of the terrace, glanced over his shoulder. Shorn saw his face in the fore-

shortened angle: white, rather pinched features, eyes subtly tilted, brows drawn down, mouth subtly down-curving. Shorn's elation gave way to sudden wariness. Dominion had arranged the telekinetic indoctrination with a peculiar facility. The easiest way to get the desired information, certainly; but was Dominion sufficiently free from vindictiveness to accept defeat? Shorn considered the expression he had surprised on Dominion's face.

It was a mistake to assume that any man, Telek or not, would accept with good grace the terms dictated by a paid turncoat.

Dominion would restrain himself until he learned what Shorn could tell him, then—And then?

Shorn slowed his motion. How could Dominion arrange a moment of gloating before he finally administered the *coup de grace*? Poison seemed most likely. Shorn grinned. Dominion would consider it beautifully just if Shorn could be killed with his own poison. A sharp blow or pressure under the jaw would break the capsule in his tooth.

Somehow Dominion would manage.

They entered a great echoing hall, suffused with green-yellow light that entered through panes in the high-vaulted dome. The floor was silver-shot marble; dark-green foliage grew in formal raised boxes. The air was fresh and odorous with the scent of leaves.

Dominion crossed without pause. Shorn halted halfway across.

Dominion turned his head. "Come." "Where?"

Dominion's mouth slowly bent into a grimace that was unmistakably dangerous. "Where we can talk."

"We can talk here. I can tell you what I want to tell you in ten seconds. Or if you like, I'll take you to the source of the danger."

"Very well," said Dominion. "Suppose you reveal the nature of the threat against the Teleks. A brain disease, you said?"

"No. I used the idea as a figure of speech. The danger I refer to is more cataclysmic than a disease. Let's go out in the open air. I feel constricted." He grinned at Dominion.

Dominion drew in a deep breath. It must infuriate him, thought Shorn, to be commanded and forced to obey a common man and a traitor to boot. Shorn made a careless gesture. "I intend to keep my part of the bargain; let's have no misunderstanding there. However—I want to escape with my winnings, if you understand me."

"I understand you," said Dominion. "I understand you very well." He made an internal adjustment, managed to appear almost congenial. "However, perhaps you misjudge my motives. You are a Telek now; we conduct ourselves by a strict code of behavior which you must learn."

Shorn put on a face as gracious as Dominion's. "I suggest, then, that

we hold our conference down on Earth."

Dominion pursed his lips. "You must acclimate yourself to Telek surroundings—think, act, like a Telek."

"In due time," said Shorn. "At the moment I'm rather confused; the sense of power comes as a great intoxication."

"It apparently has not affected your capacity for caution," Dominion observed dryly.

"I suggest that we at least go out into the open, where we can talk at leisure."

Dominion sighed. "Very well."

VI.

Laurie went restlessly to the dispenser, drew tea for herself, coffee for Circumbright. "I just can't seem to sit still—"

Circumbright inspected the pale face with scientific objectivity. If Laurie condescended to even the slightest artifice or coquetry, he thought, she would become a creature of tremendous charm. He watched her appreciatively as she went to the window, looked up into the sky.

Nothing to see but reflected glow; nothing to hear but the hum of far traffic.

She returned to the couch. "Have you told Dr. Kurgill—of Cluche?"

Circumbright stirred his tea. "Naturally I couldn't tell him the truth."

"No." Laurie looked off into space.

She shuddered. "I've never been so nervous before. Suppose—" her forebodings could find no words.

"You're very fond of Shorn, aren't you?"

The quick look, the upward flash of her eyes, was enough.

They sat in silence.

"Sh," said Laurie. "I think he's coming."

Circumbright heard nothing.

Laurie rose to her feet. They both watched the door latch. It moved. The door slid back. The hall was empty.

Laurie gasped in something like terror. There came a tapping at the window.

They wheeled. Shorn was outside, floating in the air.

For a moment they stood paralyzed. Shorn rapped with his knuckles; they saw his mouth form the words, "Let me in."

Laurie walked stiffly to the window, swung it open. Shorn jumped down into the room.

"Why did you scare us like that?" she asked indignantly.

"I'm proud of myself. I wanted to demonstrate my new abilities." He drew himself a cup of coffee. "I guess you'll want to know my adventures."

"Of course!"

He sat down at the table and described his visit to Glarietta Pavilion.

Circumbright listened placidly. "And now what?"

(Continued on page 148)

MACHINE "INTELLIGENCE"

BY EDMUND C. BERKELEY

Until a sound, agreed-on definition of "thinking" can be worked out, no man can say whether or not a machine can think. But here's a fascinating thought: What would a big, modern computing machine score on a standard Wechsler-Bellevue intelligence test? Not exactly a sensible question—but a fascinating one!

No one any longer denies that a machine can carry out many operations of reasoning.

The large-scale automatic sequence-controlled calculators—if you use Harvard language—or automatic electronic digital computers—if you use Bureau of Standards language—have proved that a machine can:

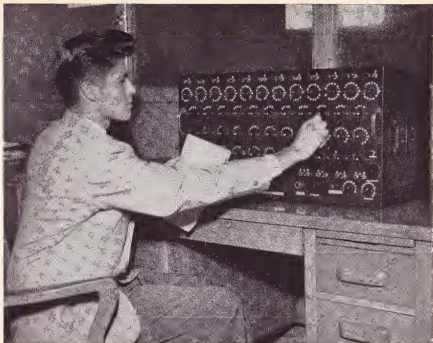
- 1) Take in numbers and instructions in machine language;
- 2) Perform the arithmetical operations of addition, subtraction, division, square root, et cetera.
- 3) Carry out these operations in long sequences of different steps;
- 4) Store upwards of a thousand pieces of information (numbers, or instructions, or indications, i.e., a one or a zero, a yes or a no, et cetera); and refer to any de-

sired item of stored information in a fraction of a second;

- 5) Select routines or subroutines depending on indications, either those given to the machine beforehand or computed by the machine in the course of solution of a problem, and so determine instructions for itself;
- 6) Check tentative answers by a variety of tests to make sure that they are right;
- 7) Put out answers in language that human beings can read.

The proof that a machine can do these things is simple. Machines physically exist that have actually done all of them.

Does this mean that one of these machines can think? Does this mean that a machine can handle ideas, in



MONROE CALCULATING MACHINE COMPANY

This small computer, invented by Theodore Kalin and William Burkhart, is unique among computing machines. Instead of doing mathematics, it is a logic-computer. Instead of working with numbers, it considers statements, and computes their logical conclusion.

the way that a human being supposedly can handle ideas?

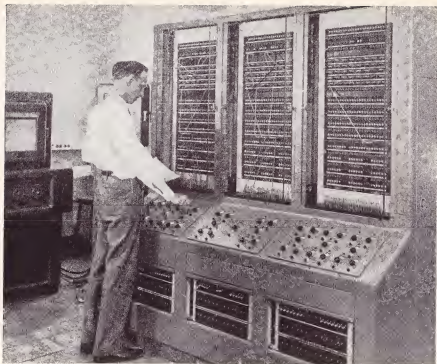
Argument: A Machine Thinking

Now there are scientists in the automatic computer field who argue, with a considerable display of emotion, that such machines as these do not think.

The argument has the appearance of being weak because it smacks of knowledge after the event. For, before the arrival of the great automatic computers, everyone would have agreed

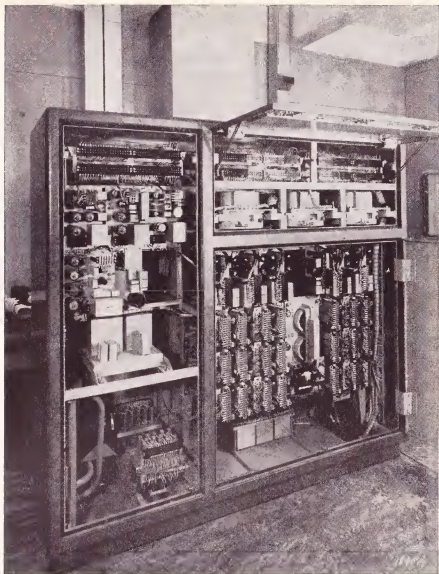
that the operations they perform could certainly be considered thinking operations. In fact, some of the scientists in the field, especially those working with the intricacies of automatic telephone switching equipment, say "If this is not thinking, what is thinking?"

But the argument is supported by citing a number of thinking operations which machines do not yet perform. Let's try to list some of them. Such operations at first glance appear to include:



The Bell Telephone Laboratories, at Murray Hill, New Jersey, has this electronic analogue computer; it is, in effect, a super-electronic-slide-rule, incapable of logic, but an excellent arithmetician. Data is fed into the machine by hand-setting potentiometers on this board; the plug-board above interconnects the unit computers.

1. Forming ideas out of sensations and recollections;
2. Expressing ideas in words;
3. Taking in words and getting ideas from them;
4. Listening to a series of sounds, recognizing them as questions and answering them appropriately;
5. Telling a story;
6. Writing a book;
7. Responding "intelligently" to a situation, like seeing a house burning, going to the telephone, calling the fire department, and telling the fire department where to go;
8. Using mathematical symbols other than numbers to solve a problem in algebra or calculus;
9. Analyzing a novel and complicated situation, and discovering a theory that explains it;
10. Looking at a scene, and recog-



The Bell Electronic Analogue Computer's computing mechanism proper. All computation work is done by the units in the larger, right-hand bay; the left bay is power supply equipment.

nizing objects from their appearance.

In short the argument becomes that a machine cannot think because there are many kinds of thinking operations that human beings can perform, and that machines cannot yet perform.

This is a much better argument. In fact, it would even be a complete argument if it did not have two loopholes. In the first place, what machines cannot yet do is no argument as to what machines in the future will be unable to do. And in the second place, the items of thinking behavior that human beings can perform and machines cannot perform may be insufficient to prove that a machine cannot "think." For the kinds of thinking behavior necessary for an organism to "think" should be settled by an impartial umpire; and breathes there a man with soul so dead that he could be an impartial umpire in such a question?

In fact, no sooner do we read over this list than we think of mechanical devices able to do something close to many of the listed activities. For example, the automatic fire alarm has long been in existence. For another example, the iconoscope in a television camera can "see"; it should not be long before some kind of scanning attachment together with a memory of shapes will enable the machine to "recognize."

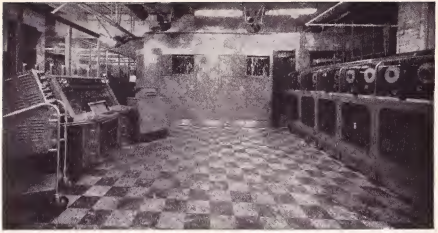
For a third example, even one of the existing automatic computers is undoubtedly able to "learn" to manipu-

late mathematical symbols. Certainly, the rather arbitrary kinds of symbols that human beings use can be translated into systematic arrays of decimal or binary digits that a machine could store in its registers. Certainly, the rules for operating correctly with symbolic expressions can be translated into rules that a machine could operate with. Perhaps it might be hard for the machine to be as astute at manipulating symbolic expressions as a trained mathematician. On the other hand, the machine would have much greater speed, accuracy and completeness. Undeniably, a machine is able to deal in any reasonable way with any kind of symbols when translated into machine language.

Education

Another of the arguments that a machine does not think is that the machine is a slave. In other words, the argument claims that everything the machine does is determined by the instructions given to it beforehand by the mathematician who programs the machine.

But this not quite true. In a complicated mathematical problem with many branching routines, no person can predict which branching routine the machine will take until it actually gets up to the branch point, and examines the indication of the road sign, which tells it which way to go. In fact if desired, random variables can be put into the machine, so that each time the



TOMMY WEBER

The UNIVAC computer installed at Philadelphia for the Bureau of Census, will analyze census reports as a primary job. This order of machine approaches the lowest level of intelligence—and can do arithmetical processes at, quite literally, lightning speed.

machine comes up to a branch point, the chance is good that it will make a different choice, and do something different.

In reality these instructions are the “education” of the machine in the same way as instructions to the mathematician constituted his education. Basically, education means teaching an individual organism what other individual organisms have found out before. The mathematician who finds out the solution of a mathematical equation is making use of the methods worked out by thousands of other human beings, many of whom died before he was born. For the purpose of solving the equation, let’s contrast the contribution made by the mathematician with the contribution made by

the society to which the mathematician belongs. We have to concede that without the mathematical knowledge gathered and passed along by the society—education—the equation could not be solved. But we can dispense with the mathematician; for we can be sure that if he did not solve that equation, some other mathematician would. Quite generally when the time is ripe for an invention or discovery, then it is made.

The profound importance of education is highlighted by the evidence that turns up every now and then in connection with human children, brought up by wolves, or in the wild, or in a closet by inhuman parents. These cases show with fearful clarity the enormous influences of social cul-

ture in every facet of human behavior and particularly the capacity to think. Nearly everything the machine does is the result of its education, and nearly everything the mathematician does is a result of his education.

Intelligence

In our exploration of the subject of thinking, and whether or not machines can think and to what extent they can think, one of the related subjects is intelligence. If a machine could take an intelligence test, and pass with a good grade, could we say that the machine could "think"? What is intelligence?

A good deal of work has been done on the subject of intelligence. David Wechsler in "The Measurement of Adult Intelligence"—Williams and Wilkins Co., 1944—says that "Intelligence is the global capacity of the individual to act purposefully, to think rationally, and to deal effectively with his environment."

If we interpret "the individual" as an automatic computer, and interpret "his environment" as the numbers and instructions which the automatic computer receives, then certainly the machine "acts purposefully, thinks rationally, and deals effectively" with its environment.

Wechsler selects ten tests for the measuring of intelligence:

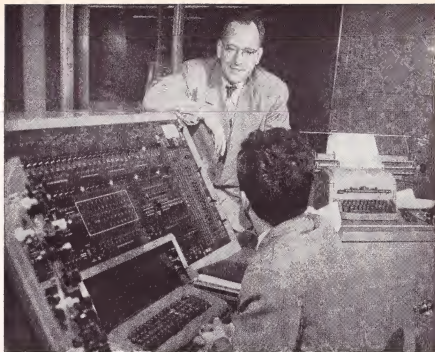
1. General Information.
2. General Comprehension.
3. Arithmetical Reasoning.

4. Digits Forward and Backward.
5. Similarities.
6. Picture Arrangement.
7. Picture Completion.
8. Object Assembly.
9. Block Design.
10. Digit Symbol.

The first test, general information, contains questions which "call for the sort of knowledge that an average individual with average opportunities should be able to acquire for himself. For example, a question like "what is the average weight of an American man?" might be included in the test. (To protect the usefulness of the tests, no actual questions from any test are quoted.)

An automatic computer with a sufficiently large memory could answer a question like this, if translated into machine language. The question is equivalent to a reference to information stored in the registers of the computer. Its mark on this aspect of the test would be 100. But for the automatic computer to "acquire the information for itself," would require putting the computer into situations quite different from those in which computers now are.

The second test, general comprehension, is aimed at measuring an individual's understanding of practical situations involving him. Questions like the following are on this test: "Suppose, as you were walking by a house, you saw a great deal of smoke start pouring out of it. What would



TOMMY WEBER

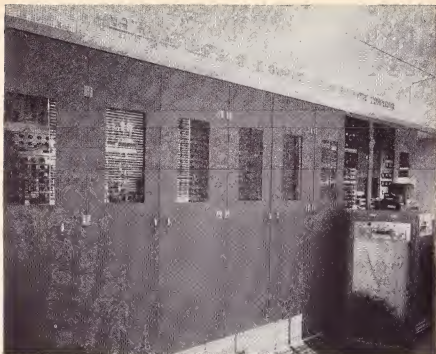
Dr. John Mauchly, one of the inventors of the UNIVAC, leaning over the Master Control Board of the Philadelphia installation. UNIVAC is an electronic digital type computer—if "counts its fingers" to do arithmetic, rather than using the slide-rule analogue computer system.

you do?" Wechsler remarks that success on the comprehension test seemingly depends on the possession of a certain amount of practical information, a general ability to evaluate past experience, good verbalizing ability, and accustomedness to setting forth ideas in words.

Here is a thinking operation which no existing automatic computer could do. For one thing, the computer does not have the sensing organs which would enable it to deal with such a

question as this. The score of the automatic computer on this test would be zero. In the same way, this question should not be asked of a blind man, who would be fully entitled to say, "I am sorry, but since I cannot see, I would be unable to do anything depending on seeing smoke pouring out of a house."

In order for an automatic computer to answer a question like this, the machine would require a variety of perceptrons—sensing organs—consider-



The great computers have become as essential to scientific research as libraries and laboratory equipment; the National Bureau of Standards has installed a major computer.

able capacity to record sensations in its registers, a capacity to form and deal with ideas—which we shall discuss below—and a capacity to express ideas in words and report them.

The third test, arithmetical reasoning, consists of ten simple questions expressed in words. An example of a question is: "If a woman buys thirty-five cents worth of sugar and gives the salesman fifty cents, how much money should she get back?" The answer depends on recognizing and carrying out a simple addition, subtraction, multi-

plication, division, or proportion. No unfamiliar words or unfamiliar situations are allowed in the test, and so the questions avoid trouble in reading.

An automatic computer, of course, would have no trouble with any part of the test, if the questions were translated into machine language. Its mark on this test would be 100.

In the fourth test, "digits forwards and backwards," the tester—person administering the test—first says "I am going to say some numbers. Listen carefully, and when I am through, say

them right after me." For the first question, the tester then reads slowly a series of digits, like 6, 9, 1, and stops, and the testee then repeats 6, 9, 1. The next question is a series of four digits. The last question is a series of nine digits. In the second part of the test, the tester says: "Now I am going to say some more numbers, but this time when I stop, I want you to say them backwards." The series for the backwards test ranges from two digits to eight digits.

This test is essentially a test of some of the individual's capacity to store information, his memory. Certainly, an automatic computer would have no trouble at all with such a test, and could easily remember a much longer series of digits, and repeat them either forward or backward. Its score would be 100.

The next test, similarities, contains twelve questions like "In what ways are a cat and a horse alike?" The response is credited with 2, 1, or 0, depending upon the degree and quality of generalization. A full credit answer would be "they are both animals with fur." A half credit answer would be "they both have four feet." A zero credit answer would be "a cat meows and a horse neighs." From question to question down the test, greater and greater generalization is needed to express the likeness of the two ideas.

A properly educated automatic computer would be able to do excellently on this test, if—as regularly—the ques-

tions were translated into machine language. The computer would contain in its storage registers a lot of information about terms and their properties. It would be able to compare quickly any two terms to see what properties they have in common. It would discover what term in all its collection of terms expressed the largest number of those common properties. Then it would give the answer, easily and systematically. The computation is essentially a problem in the algebra of logic called Boolean algebra. The machine's intelligence score on this test would be 100.

We could go on and discuss the remaining five intelligence tests, and the way in which automatic computers would be able to score on them. But enough has been said to show two things.

First, although these intelligence tests were constructed without any thought of a machine taking them, nevertheless a machine could score rather well on many of them.

Second, the areas where the machine gets a low mark are associated with the following factors:

1. Making use of sensing instruments (perceptors);
2. Organizing the sensations into shapes and patterns;
3. Organizing shapes and patterns into ideas and experience;
4. Learning from experience;
5. Going from ideas to words and from words to ideas.

Sensation

Sensing instruments, of course, have developed far beyond the powers of human beings to feel sensations. With hardly any trouble, scientists can attach sensing instruments to automatic computers, whenever someone wants to. In fact, such data as wind tunnel observations and telemetering data, have been fed directly from observing instruments into automatic computers.

The whole structure of science probably depends on the invention and development of sensing instruments. Most instruments have simply translated physical observations into the language of the human senses, chiefly sight.

No, the gap in the intelligence of automatic computers is not in the ability to sense by means of mechanical instruments.

Shapes and Patterns

But, for a machine to organize sensations into shapes and patterns is harder. Occasionally, we as human beings notice the effort we have to make, as when we try to read illegible handwriting. We may spend a half minute, considering carefully whether the letters are "lr" or "bi", or perhaps "cl" or "d." We use knowledge of the ideal shapes, the spelling requirements of the word in which the obscure letters appear, comparison with other letters as written by the same writer on the page, and finally statistics and random guessing.

To produce shapes for an automatic computer, we have to go further than the TV screen. The screen produces an image indiscriminately, like the image recorded by the iconoscope, and does not furnish any shape. In order to arrive at shape, a comparing circuit and stored recordings of shapes must be available.

Steps have been taken in this direction. David Shepard of Falls Church, Virginia, has recently produced a model of a machine that will "read" typewritten letters on a sheet of paper, and then impulse an electric typewriter to copy them. The principle of this machine is simple and excellent: an image of the letter is thrown on a scanning disk, which senses the presence of shadow in certain patterns—a vertical line, a large curve, et cetera. The sensed features are then recombined by a circuit network to give impulses to the typewriter. More research in this field will lead to further progress, in teaching automatic computers how to organize sensations into patterns.

Ideas

But how do we get a machine to handle ideas? What are ideas anyhow?

The simplest approach to a down-to-earth unromantic account of ideas is to consider first the "idea" that an automatic oil furnace "has" of hot and cold. A thermostat sits on the wall of the living room, and when the temperature goes down a degree or two, a

piece of bi-metal curves a little more than before, and closes a relay contact, which lights the flame in the furnace and finally results in heat coming up to the living room. After a while, the heat coming out of the radiators in the living room warms the air, which warms the thermostat, the piece of metal curves a little less, the relay contact opens, the flame goes out, and the living room starts to cool down. That automatic oil furnace "has an idea" of hot and cold; that idea, for the furnace, is "relay open" or "relay closed." If we want to change the machine's idea of hot and cold, we turn the little dial on the thermostat on the wall, and make it read the temperature we want.

The next step in understanding the nature of ideas is the case where a large number of ideas are to be dealt with, but each one has one and only one representation. Branches of knowledge have a tendency to develop to the place where each idea is represented customarily by one and only one symbol. Mathematics is one of the best examples. In mathematics we use "2" most of the time, and not "pair, double, brace, couple, two, deux, zwei, duo, et cetera." An idea is the meaning of an expression, a symbol. The meaning is established by a network of associations between symbols, meanings, and behavior.

The existing automatic computer recognizes and deals with this kind of idea, except that its perceptrons and its

shape recognizing facilities are still very limited, and so its associations are poor. But it does have a large number of registers for containing a large number of ideas, represented rather uniquely by their symbols.

The next stage in understanding the nature of ideas is the case where there are a large number of ideas, and a large number of symbols, such as words, and there is a considerable amount of mix-up between them. A word may have a number of meanings, be associated with a number of ideas; and an idea may be expressed by a number of words. What happens then?

Well, it is like the shape-recognizing situation again, only worse; efficiency depends upon a good many comparing circuits, and a lot of statistical knowledge, so that good bets on the meaning of a set of words can be made.

An automatic computing machine which has developed a wonderful facility in this particular kind of problem is the military deciphering machine, of which persons like myself who do not wish to be contaminated with classified information know very little. Hearsay says that it works on the principle of making a huge number of comparisons very fast, and testing possible meanings by calculated statistical parameters like the mean and standard deviation.

Certainly a much less sophisticated kind of deciphering machine could learn to deal with words and ideas in limited fields. For example, the ma-

chine could readily compute the chance of a given meaning for a sentence in a context. It could be educated or programmed to express an idea in words, and determine the ideas expressed by words.

Could such a machine write a book or tell a story? When we remember that every human being writes a book or tells a story differently from every other human being, it should be quite possible for the machine to do so equally differently. One of its greatest requirements, of course, would be a really large memory—for all the words and the ideas that it might want to refer to, and for the procedures adopted by good writers, such as unity, coherence, emphasis, and the like.

Learning from Experience

The last gap of the argument that machines cannot think usually takes the form of the assertion that a machine "cannot learn from experience." This argument asserts incidentally that an earthworm can think, because it can be shown that an earthworm can learn from experience. But can a machine learn from experience? How far can a machine get on an animal test of learning from experience?

The comparative psychologists have done a good deal of work on the question of how much an animal can learn from experience. Carl J. Warden in an article "Animal Intelligence" in June *Scientific American* says "Intelligence may be defined as the capacity of an

organism to learn to adjust successfully to novel and difficult situations. . . . It would seem that the true measure of intelligence is the capacity to learn, regardless of the method involved." He reports on a lot of testing of animals to discover their relative intelligence, in terms of solving certain problem situations. One of his tests is the "multiple-plate problem box." In the center is a cage with food in it and with a gate that is closed but may be opened by remote control. Outside the cage is the rest of the problem box, containing three special electric plates set in the floor. Suppose the plates are numbered 1, 2, 3. Then the animal, in order to have the gate open, is required to step on the plates in a certain order: After the animal has learned to step on just one plate, No. 1, then plate 2 is added, and the gate opens only if first plate 1 and then plate 2 are stepped on. The guinea pig can learn no more than one plate. The white rat can learn no more than two plates, in the order 1, 2. The next sequence of plates to be learned is 1, 2, 3; the fourth sequence is 1232; the fifth sequence is 12321; the sixth is 123212; and the complete solution is 1 with 2321 recurring indefinitely. A cat can learn a sequence of seven plates, and a monkey a sequence of twenty-two plates. Dr. Warden says no animal learned the indefinite recurring sequence. These scores are for the animals that were the most intelligent of each species tested—a high extreme, and not an average.

Can we program an automatic computer, such as the Univac, to solve this problem? Of course we can. Here is the general way in which it would be done: Allow the automatic computer to have one thousand registers. Suppose forty of these registers store information about forty places in the problem box, in the form of a number of ten decimal digits. If Place No. 24 in the problem box contains food, then the first digit of the number in Register 24 is 1. If the food is "locked up," then the second digit in every one of the forty registers—not only Register 24—is 1, up until the time when the machine has "found out" the unlocking sequence of moves. At that time, there is a pause during which all these second digits change to 0, thus indicating to the machine that the food is no longer locked up. The third digit in each register is 1 if the place associated with that register contains one of the special plates of the problem box.

The machine has a comparing circuit. So it is able to tell whether or not a digit in some place in some register is 1 or not 1.

We program the machine with a number of subroutines: a subroutine for finding out that a certain register has food in it; a subroutine for "going" from one register to another; a subroutine for selecting a register to which it will go; a subroutine for noticing that a certain subroutine is to be preferred to another subroutine because it results in fewer trips through the

registers; and so on.

The problem has a lot of resemblance to many mathematical problems, and there is no doubt that the machine can do it.

Now it may be argued that after all the machine has been programmed by someone, the "mathematician," and so it is the "education" of the machine which is responsible for its successful "learning from experience." W. R. Ashby of Barnwood House, Gloucester, England, the inventor of the Homeostat, has recognized this problem. He says: "The problem of the mammalian brain, then, is that as a machine it has to work out an essential part of its own wiring." The essence of the ability of the brain to work out its own wiring, is, he says, the principle of negative-feedback.

It seems clear that it would be quite possible to give certain very general instructions of "negative-feedback" type to a big automatic computer like the Univac. Then after a while it would have worked out its own programming for the problem-box situation.

And so we come to the conclusion of this whole discussion: the problem-boxes of comparative psychology, the tests of adult human intelligence, the lists of difficult thinking operations, should all be used as a guide to the construction and programming—birth and education—of really versatile future automatic computers.

THE END

HYDROPONICS

BY CARROL L. KLOTZBACH

Hydroponic-grown plants have long been suggested as the source of both food and air for spaceships and extraterrestrial living-domes. The theory is excellent—but here's the bitter report of someone who actually tried making the darned plants grow!

As we readers of Astounding are aware, no space vehicle or Lunar Dome is complete without its hydroponic garden. These presumably furnish lettuce and tomato salads and do double duty by also cleaning up the contained air for the inhabitants. They probably furnish a bowl of roses for the commandant's wife on demand too—people being what they are.

What with having been rather heavily involved in this enchanting method of agriculture for some years it is quite natural that I have given quite a bit of thought and fancy to the subject, particularly as it might apply to space scooting and planetary horticulture. So far the planning has remained in the pipe-dreaming stage as I feel sure that considerable time is going to elapse before post office bulletin boards display notices of "Examinations (Form 114-A GPO) for Agriculturists—Hydroponics-planetary." I suspect that

before that time my personal spook will have gathered many a posy in the Elysian Fields.

The job has problems right here on Earth regardless of what its promoters might say—or fail to state. The growing of plants by this method is not too difficult provided one consults the plants to be grown and makes careful endeavor to meet their requirements. Some plants are easy to satisfy and tough enough to survive almost any old kind of mismanagement. Others are very fussy and particular and will keep the nurse sitting up nights with spoon and bottle and go into declines at the drop of a part per million. Unfortunately the answers are not all in as yet. One important answer, from the standpoint of the would-be investor is that to date it has been an economic bust. The riches are not there. Given soil, chemical fertilizers, and access to a barnyard the energetic

farmer still makes a bum out of Jonathan Q. Test Tube, Ph.D., Chem.

In a situation where the profit motive has been eliminated and "vegetables and clean air are imperative and hang the cost, the hydroponicist might then come into his own, provided the plants could be persuaded to co-operate, and a lot of little "ifs" and "buts" solved. Even in my wildest flights of fancy these gremlins pop up to mess up the dream. Before going into some of them it might be well to give a brief rundown on current methods hydroponic as a starting point.

The earlier methods involved planting in beds made up of nettings filled with chips, moss, shredded wood or some similar vehicle. These were placed over vats containing nutrient solutions. The beds were sprinkled until the plants were started and the rootage sufficiently long to dangle into the solution. From there on it was a matter of maintaining the solution and watching them grow. Little troubles like aeration cropped up and big troubles came in cropping and cleaning up the mess after the crops.

The current method is somewhat different and much easier. Concrete beds, usually 100' x 4' x 8" deep are used. A center trough covered with barrel tile furnishes the flow pipe for the solutions. Inert gravel with particle size running from coarse sand to one fourth and one half inches in diameter is loaded into the beds to within an inch of the top. The beds are

level and watertight of course. The solutions are flushed into the gravel to the desired height and immediately drained off. This is done sufficiently to keep the moisture content as high as the plants may require. Irrigations may be two or three per day for tomatoes, four or five for cucumbers, one every three days for carnations and so on, according to the behavior and water requirements of whatever is to be grown. It may be noted that idle beds manage to grow magnificent weeds without any attention or irrigations whatever. Only the economic plants are fussy.

Installation costs are rather high. A half acre land coverage, with twenty beds, solution tanks, pumps, spray equipment, sheds, et cetera, will run to at least fifteen thousand dollars exclusive of the cost of the land. It can only be obtained this cheaply if great care and economy is exercised; most of these farms have run much higher.

With such a unit as this and given perfect weather conditions, good crops, market and so-on, the owner might—should he and wife work themselves to a frazzle and worry themselves into a case of ulcers—realize a fine fat profit of twenty-four hundred dollars per year before taxes. I said he MIGHT! And he might not.

So far as the chemistry goes one does not need a white coat, a pipette and a set of apothecary scales. The results seem to be the same if a shovel and a bucket and a rough idea of how much

of this or that should be used. The formulas are many and varied and no startling results have been produced from any of them and certainly none that are shockingly significant. Many operators look profound and become secretive when approached on this subject. They will mumble about a secret formula—when the crop looks good. Should it look bad there is talk of “impure” chemicals having sneaked in. It is true that their formulas are secret, even from themselves.

From the promoter's standpoint, hydroponics is a honey. It has lots of appeal—be your own boss, engage in this fascinating new method of Scientific Agriculture, practically no work, bugs or diseases, no messing around with barnyard products, just sit on the porch and watch them grow under your personal magic test tube. They neglect to add “no profits” but come up instead with some nice fast figures that bring rosy dreams of expensive gowns to Mamma and admiration of his fellowman to Papa. You can't lose. Here, take a look at the figures!

They go something like this. Suppose you have twenty beds 100 feet long wherein are planted three rows of tomatoes, the plants spaced a foot apart. This comes to six thousand plants and all growing prettily. Then a bulletin from Professor Hydrokopf of Liverwurz Ag College is cited—the professor grew sixteen pounds of tomatoes per plant, he says. So let's be

conservative and be satisfied with ten, multiply by that and the crop comes out to sixty thousand pounds. Now, says the promoter, these are fancy fruit and will bring a big price what with being loaded with vitamins and sundry other things. We should get twenty cents per pound wholesale, easy. Simple multiplication brings us to twelve thousand dollars. Take off two for expenses, grow two crops per year and what have you? Trouble with the Internal Revenue Bureau! One crop and you pay off the mortgage! Two crops and you buy a Cadillac! Three and you are a patron of the arts and a delight to your banker and pillar of the community.

Instead it is usually one, two, three and OUT! The Buts and Ifs have given you the business. And what were they? Well, first off Professor Hydrokopf or Heinegaboodle got the sixteen pounds of tomatoes all right but it took ten months. He also weighed everything, culls, bird pecks, cat faces, weather cracks—everything. He also picked them full ripe when they weighed the most. His few test plants received more attention than his wife, bugs were carefully tweezered off. They were screened, glassed, rinsed, shampooed. Now with six thousand plants this is impracticable. It is all one can do to prune and tie and spray. There are also weeds to be removed from the beds, baskets to buy, solutions to be built and the Ph watched, viruses that can wreck the works,

frogs in the pumps, clogs in the beds, insect raids and infestations, windstorms, hail and hell to pay.

The ten pounds per plant has dwindled, shrunk beyond all recognition. A chilly rain as the crown hand comes full and there goes a lot of extra fancy into the cull class. Early blight, late blight.

The plants are also fussy over temperature and humidity and like their nights cool and days warm, they like to sleep under a light blanket so to speak and run about in shorts during the day. There are all sorts of unsolved difficulties. "Blossom end rot" is one that remains a puzzle and a careful perusal of all existing bulletins seems to show that a lot of people have rushed into print with nothing much to say on the subject — even as I have rushed into print without even one experiment on plants under conditions of free fall.

Fungi arrive and flourish despite coat after coat of supposed inhibitory sprays. The average tomato crop is copper plated so to speak, oftentimes without effect. Along with the plant difficulties the human back, by design being better fitted for draping in an easy-chair, aches and aches.

The costs mount and the harvest declines. On that grand day when the harvest is finished and the totting up begins there are a succession of shocks. The super-duper vitamin charged, mineral loaded, strength-through-joy fruits have turned out to look like any

other tomato and have brought the standard or going rate on the market. The yield per plant, minus a lot of sick and underdeveloped culls, has declined from the conservative estimate of ten pounds per plant to a yet more conservative one of three pounds. One is also faced with the removal and disposition of the old plants, the removal of rootage from the aggregate, unplugging of stopped drains, and the soaking out and cleaning of the beds.

After that a new set of optimistic figures — cucumbers this time. An insignificant worm — the pickle worm — does you in this time. The next step is to sell out providing a sucker shows up. He takes over, mortgage, secret formula and all and the wheel turns again — optimism, enthusiasm, figures, seeds in, dear little plants wagging their precious gold-bearing cotyledons in the morning air — all ending with the hunt for another sucker who wishes to be at one with Burbank.

It is with this bitter background that I do my daydreaming and questioning over Si Corn tassell, space horticulturist. Having observed plant behavior and misbehavior on Earth one wonders how they will perform under the new environment. They are a hide-bound lot and become insulted quite easily when one tampers with their surroundings. They are stuffy about diet and huffy over their lighting arrangements. A lot of juice and a lot of research will be used up before this is

a success under artificial light. Most plants are hogs for water and belong to the fresh-air school. Very small concentrations of undesirable elements in either and they are off to plant Valhalla. Of course, there are many and we should be able to make suitable choice from the four hundred seventy-five thousand or so species at hand.

Large groups can be eliminated, narrowing the field somewhat. The Liliaceae we can toss out, I think, without overlooking much once we have seized the onion and garlic. These could hardly be called air purifiers . . . but some years ago the Russians came out with some yak-yak over the curative properties of sliced onions in fixing up infections of sorts. Folks also firmly believe in garlic as a means of warding off colds and influenza. There is an element of truth in all this. Load the patient up with garlic and others avoid him, an automatic quarantine is set up and the epidemic is stopped. Penicillin seems to be better for the cure of pneumonia than chopped onion poultices and not nearly so messy. But who are we to sniff at a Russian soaked in onion juice! I remember that as a boy in Kentucky one was treated for bee or wasp stings by application of a fresh horse dropping applied firmly to the place of impact. With the rise of the automobile and subsequent decline of available horse-tablets we now get our ammonia from a bottle with less likelihood of tetanus. The method is worth knowing, however, should one

encounter a non-co-operative bee in the green pastures and far from a drugstore.

So on to more suitable plants. There are some familiar ones that would seem quite suited to the fetid atmosphere of the spaceship, at least they give evidence of the ability to survive difficult situations. Consider good old *Ficus Elastica*, who, from its lush beginnings in the Tropics has traveled to Brooklyn and had a book written about it. It manages to get along in hallways reeking of boiled cabbage, mothballs, coal gas and wet wool; it survives periods of drought broken by eras of loving care. Now there is a plant to inherit the Earth and possibly Venus. But you cannot eat it and I doubt its air-cleaning capacities except as a place for dust to settle. Its only other use seems to be to furnish an emergency supply of stickum should a postage stamp fail to adhere.

There are some others in the Moraceae of interest, particularly to readers of the Sunday Supplement. *Brosimum galactodendron* or the Cow Tree, the plant world's only rival to Elsie Borden, would be just the thing for the Lunar Dome. It grows rapidly AND — it is so stated—the sap resembles fine rich homogenized milk, except that it tastes better. The weary traveler taps the tree and is refreshed. Have to be careful on this introduction though. There are relatives, practically identical twins, that gush a latex similar in appearance and flavor to

Brossy—with the exception that one winds up with a tennis ball in the gizzard. A ball check valve in the human intestine is something Nature has made no provision for and is apt to cause trouble.

Or consider the confusion and frustration confronting a common or Navy bean on the Long Passage. On Earth the bean, as shown by experiment, knows which way is up, an ability not always shared by its human consumers. You know the experiment—sprout the bean and when the radicle has decided which way is down and has started in that direction, turn it over so that it is aimed at the stars. What happens? The radicle does a back bend and down she goes again. Can't fool a bean. No one has managed to get a bean to grow upside down, that is, to attempt to root itself in the full moon. So we are off in space. I can only picture the radicle waving madly around—at 1 rpd—trying to find out which way is down, or up! Now if we knew exactly what influences the bean in its decisions we might be able to help out. We have a name for it but merely saying Geo-something-or-other does not explain it or get it into a bottle.

For that man or woman who has spent long hot days tying up cukes or tomatoes to avert Newton's Law the prospect of free-floating pickles sans strings, clips or wires is fascinating. Fine until a change in speed; there

would be chopped salad either on deck or ceiling. The reason I harp on tomatoes so much is that it has been shown time and time again that alteration of human dietary habits is almost impossible, even under great stresses and strains, including hunger. Judging by human behavior there is little use trying to substitute food plants other than those to which the spacer has been accustomed. The New Englander pines away without his boiled dinner, the Eastern shoreman goes into a decline in the absence of crab cakes a la Maryland and the cannibal gave up his Roast Young Man au Jus with great reluctance. So for food plants we cannot go nipping off and introducing unfamiliar food products even though they might behave better in the hydroponicum.

The Japanese eat chrysanthemums, suggest a Mum salad to your neighbor—not a Japanese—and what do you get. Looks of suspicion that indicate that any day now he expects to be sending cigars to the local looney bin—to you, of course. They also find grasshoppers very tasty—dried, slightly salted and with the legs off. Try serving them the next time you have a few people in and see what happens, unless your few people are Japanese, Ubangi or Digger Indians. Even after the sixth cocktail people will remain hungry. Whenever I read of Joe Starscraper sitting down to a meal of some strange animal I know there cannot be anything strange about its appearance and

taste. He'd rather starve. Incidentally, someone in Astounding has been naming some edible beast "Ayah"—which always brings me up short. I can only envision boiled Oriental Nurse with, perhaps, Sauce Bechamel. Maybe tasty at that—but not for me.

What fun it would be to head up the Department of Plant Exploration and Introduction on a hitherto plantless planet, provided things could be made to grow there, hydroponically or otherwise. One easily recalls plants NOT to be introduced; the coastal sandspur for one. It is vicious anywhere but achieves its greatest glory in Florida. The reason that bathing beauties are always photographed poised on tippy-toe is the inevitable presence of a thorn or spur in the heel. The relatives of the Cow Tree have already been mentioned. Golf courses could be kept free of crab grass of course. On a gravity minus planet the present ball would have to be modified somehow—made less resilient or it might go into orbit.

Spinach and some other gastronomical monstrosities might well be left to the vote of the male population. Poison Ivy could be left home without stirring up nostalgia in the colonists. Cacti have their points—but there would seem little point in bringing them in.

Plant behavior under these altered and special conditions could be very exciting. In a bugless and disease-free environment perhaps the seed catalogue pictures and promises could come true. Envision those cabbages

and tomatoes, those succulent beans, toothsome lettuces! And consider what might happen were we to introduce Cieba Pentandra, the silk cotton tree, to conditions without the usual retarding elements. Matters might easily get out of hand. This tree manages nicely though racked by hurricanes, starved and thirsted in rocky island soils. I remember one in a cemetery near Caibarien, Cuba, where the somewhat augmented food supply—the embalming fluids did not seem to have too much of an inhibiting effect—has helped the tree to make quite a go of things. It was engulfing tombstones and tipping over large tombs. It gave the impression it was just feeling around and that at any moment it might discover its real muscles and do something about all Cuba. Some of its roots were so reminiscent of the Asgaard Serpent that one tended to shy away.

Plant one in the Lunar dome for shade and a bit of greenery. Then stand well back!

"We will develop new plants to meet the situation" suggests my friend and confidant. A nice thought for which I am grateful and in answer to my "How?" I get back "Colchicine." I can see he has been sneaking a look at the Sunday Supplements again. Colchicine! Just rub it on and everything is different, perhaps. Despite the SS no startling shenanigans have been managed with its use. So

far we have not achieved pre-marinated salad vegetables or baked apples with rum and cinnamon. We do have a tetraploid snapdragon which seems to be a break for the bees and aphids and a few florists. Beyond this there is little to get into an uproar over. Colchicine is still most useful as a specific for the gout. And the plant products of the atom bomb blast have been largely bombast, the local flora of Nagasaki and Hiroshima is yet familiar to the inhabitants. The beans still grow up and down and are still beans. An onion is an onion for a' that.

Perhaps good old T. D. Lysenko could come up with plants suitable as air purifiers and cleaners but so far there is little evidence that such a function might be achieved. We might make it SMELL better by growing nice fragrant types but Chanel Number Five behind the feminine ear does the same thing, only better and much cheaper. The removal of noxious gases is unlikely as plants are fresh air fiends.

The introduction of small squirts of CO₂ into the greenhouse has been slightly beneficial according to some observers. One squirt too many and there are no pot plants for Mother's Day. The types of plants that *do* survive or have the greatest resistance are almost always the most obnoxious to ourselves. Should anyone care to establish a foundation with an adequate salary I would be glad to commence research. I already have a few

plants picked out and number one on the list is Spanish Moss, familiar to all who have traveled South of Virginia. Mechanically it should be good as a dust filter. How it would make out as an absorber of gases remains for that salaried foundation to discover. It also makes good mattress stuffing and is not bad for starting a fire. It is picturesque and would tend to keep our spacers of Southern origin from being too homesick. It is a little too scratchy for weaving underwear but technology should get around that. This plant would require no hydroponics, only a tree to drape itself on.

In this case the live oak might be best but a bit slow on the grow. One of the before-mentioned Ficus species, if found suited for the moss would be fine. On some of them the fruits are slightly edible but it is not for this that they should be chosen. Take old Mata de Palo or the Strangler fig; grows outrageously, multiplies its trunks—a specimen near Mexico City once covered ten acres—and provides living quarters of a sort for the outdoors type. Foliage is nearly permanent. Its whole habit of growth seems to indicate that this is what happened to some prehistoric branch of the octopii. This is one way of getting rid of an unwanted hydroponicum. Plant one and back away for a few years.

For the wet, warm planet nothing could be quite so ruinous as the accidental introduction of the Water Hyacinth, now threatening the South-

eastern Coastal area of the United States and particularly South Florida. Were the Gulf of Mexico fresh it would now be more impassable than the fabled Sargasso Sea. It would be undoubtedly littered with rusty old battleships and aircraft carriers with perhaps an occasional marsh buggy. As matters now stand it chokes the rivers and lakes and unceasing warfare is necessary for survival in some areas. Its one redeeming feature is the lovely flowers. These are difficult to get at and one is too liable to come up with a water moccasin attached to the thumb. A must NOT for the damper worlds. This is, of course, one of Nature's adaptations of hydroponics and look what she's done with it!

The mechanics of the hydroponic operation foul up my earth-bound imagination. Underway in space one would have to use a forced spray to wet down the roots—and remove the excess with a vacuum device. Can't just apply it and leave it there unless one discovers a means of replenishing the oxygen in the solution. Of course for a media the gravel would have to be replaced with something like miniature ping-pong balls, light-weight and inert. But all these matters could be worked out I am sure. The big worry and question is, what plants? Bananas? Mushrooms? Algae? Lichens? Epiphytes? I incline to the suspicion that on the nutrition side it will turn out to be something not very tasty.

Of course we can get around that by a little taste bud and mind conditioning, a matter proven possible. Consider if you will the food faddists. I know a number of them, in fact am one myself. I observe that with them the criterion of a food's health value lies in its unattractiveness. Anything that tastes good is bad for you and vice versa. My fad is a little different. I lean towards all the expensive things like choice Western steaks beclouded with mushrooms and more than a soupçon of onions, French fries on the side, strong coffee and pie. It is freely predicted by my soybean-hamburger-eating friends that *my* diet is going to cause trouble. So far the troubles have all been financial. The frustrations brought about by a per pound price of \$1.25 are probably going to lead to a life of crime.

I fear that the answer is not algae; or yeasts. Periodically I read that someone has come up with a new protein product that can be produced in quantities to feed the world. The catch is to get the folks to eat it—and spacemen are not going to be any different. Look at the oversupply of powdered eggs. There is a limit to what man will do for his country and the morale of any army goes to pot on powdered eggs. So with Joe Moonraker, try giving him a gooey algae sandwich that "tastes just like steak" and what happened to Captain Bligh will give you some idea of affairs in the Rift after about a week of that. The

dietitian is going to have a big say in what is grown and used and the percentage of ash or vitamin content will not be the deciding factor. These will consist largely of familiarity and flavor. There had better be a little rum in the beverage department also.

I lean to the suspicion that new arrivals on any distant gob of matter that shows any signs of greenery will not have to beat the bushes very long before coming upon the odor of fried fish and hush-puppies, presided over by a citizen that carries a rabbit's foot for a charm, chases women, believes in ghosts and votes the straight Venucrat ticket. Should he be in the back country you can bet your force-field chapeau that he will expand with conscious pride as he proffers you a jug and says "Made it myself." And I will give odds he will be scared of the dentist. He also might be found monkeying around with various vats and chemicals and a secret formula guaranteed to produce sixteen pounds of tomatoes per plant. Object, cash—also information on how to feed a rocket crew for a trip to the Earth.

You probably have gathered by now that this particular old Earthbound hydroponicker views the subject with a certain amount of amusement. This is possible now that I am no longer in the field and view it with the same grim chuckles in retrospect that the survivor of a shipwreck or earthquake manages. It is only funny because it's over with. Mind you this is not the

pose of the arrogant expert. I cannot perhaps, envision it as a useful method because of LACK of knowledge. It cannot be said that lack of imagination messed it up—I imagined those figures were all right—in fact now and again I find myself toying with pencil and paper, the market reports on lily bulbs or essential oils, and invariably come up with twelve to fifteen thousand a year income and nothing to do but irrigate the plants off and on. Fortunately I manage to keep these aberrations to myself and so avoid the looney bin. I also am without the wherewithal to reinstall myself in a hydroponicum even at their present very depreciated prices.

Ergo, should I find myself superintendent of the agricultural department aboard airsquirt *Trader*, bound for Lactic in the Milky Way you can bet on one thing when you hang around to watch the loading. The train that backs up for my department will consist largely of gondolas, half loaded with old river bottom loam and the other half with well rotted manure. A little messy, but I bet the radishes will appreciate it. There will be a small hydroponic unit along also. This I shall carry aboard myself. It will consist of a small bowl filled with gravel and water wherein a plant tab has been dissolved. A bowl of daffodils will look nice on the table now and then.

THE END



INSTINCT

BY LESTER DEL REY

The trouble with an instinct is that it's a ritual—something that started sometime with a purpose. The purpose is lost; the reason for the purpose is lost, and only the ritual remains . . .

Senthree waved aside the slowing scooter and lengthened his stride down the sidewalk; he had walked all the way from the rocket port, and there was no point to a taxi now that he was only a few blocks from the biolabs. Besides, it was too fine a morning to waste in riding. He sniffed at the crisp, clean fumes of gasoline appreciatively and listened to the music of his hard

heels slapping against the concrete.

It was good to have a new body again. He hadn't appreciated what life was like for the last hundred years or so. He let his eyes rove across the street toward the blue flame of a welding torch and realized how long it had been since his eyes had really appreciated the delicate beauty of such a flame. The wise old brain in his chest

even seemed to think better now.

It was worth every stinking minute he'd spent on Venus. At times like this, one could realize how good it was to be alive and to be a robot.

Then he sobered as he came to the old biolabs. Once there had been plans for a fine new building instead of the old factory in which he had started it all four hundred years ago. But somehow, there'd never been time for that. It had taken almost a century before they could master the technique of building up genes and chromosomes into the zygote of a simple fish that would breed with the natural ones. Another century had gone by before they produced Oscar, the first artificially made pig. And there they seemed to have stuck. Sometimes it seemed to Senthree that they were no nearer recreating Man than they had been when they started.

He pushed the door open and went down the long hall, studying his reflection in the polished walls absently. It was a good body. The black enamel was perfect and every joint of the metal case spelled new techniques and luxurious fittings. But the old worries were beginning to settle. He grunted at Oscar LXXII, the lab mascot, and received an answering grunt. The pig came over to root at his feet, but he had no time for that. He turned into the main lab room, already taking on the worries of his job.

It wasn't hard to worry as he saw

the other robots. They were clustered about some object on a table, dejection on every gleaming back. Senthree shoved Ceofor and Beswun aside and moved up. One look was enough. The female of the eleventh couple lay there in the strange stiffness of protoplasm that had died, a horrible grimace on her face.

"How long—and what happened to the male?" Senthree asked.

Ceofor swung to face him quickly. "Hi, Boss. You're late. Hey, new body!"

Senthree nodded, as they came grouping around, but his words were automatic as he explained about falling in the alkali pool on Venus and ruining his worn body completely. "Had to wait for a new one. And then the ship got held up while we waited for the Arcturus superlight ship to land. They'd found half a dozen new planets to colonize, and had to spread the word before they'd set down. Now, what about the creatures?"

"We finished educating about three days ago," Ceofor told him. Ceofor was the first robot trained in Senthree's technique of gene-building and the senior assistant. "Expected you back then, Boss. But . . . well, see for yourself. The man is still alive, but he won't be long."

Senthree followed them back to another room and looked through the window. He looked away quickly. It had been another failure. The man was crawling about the floor on hands

and knees, falling half the time to his stomach, and drooling. His garbled mouthing made no sense.

"Keep the new robots out," he ordered. It would never do to let the public see this. There was already too much of a cry against homovivifying, and the crowds were beginning to mutter something about it being unwise to mess with vanished life forms. They seemed actually afraid of the legendary figure of Man.

"What luck on Venus?" one of them asked, as they began the job of carefully dissecting the body of the female failure to look for the reason behind the lack of success.

"None. Just another rumor. I don't think Man ever established self-sufficient colonies. If he did, they didn't survive. But I found something else—something the museum would give a fortune for. Did my stuff arrive?"

"You mean that box of tar? Sure, it's over there in the corner."

Senthree let the yielding plastic of his mouth smile at them as he strode toward it. They had already ripped off the packing, and now he reached up for a few fine wires in the tar. It came off as he pulled, loosely repacked over a thin layer of wax. At that, he'd been lucky to sneak it past Customs. This was the oldest, crudest, and biggest robot discovered so far—perhaps one of the fabulous Original Models. It stood there rigidly, staring

out of its pitted, expressionless face. But the plate on its chest had been scraped carefully clean, and Senthree pointed it out to them.

"MAKEPEACE ROBOT, SER. 324MD2991. SURGEON."

"A mechanic for Man bodies," Beswun translated. "But that means—"

"Exactly." Senthree put it into words. "It must know how Man's body was built—if it has retained any memory. I found it in a tarpit by sheer accident, and it seems to be fairly well preserved. No telling whether there were any magnetic fields to erode memories, of course, and it's all matted inside. But if we can get it to working—"

Beswun took over. He had been trained as a physicist before the mysterious lure of the biolab had drawn him here. Now he began wheeling the crude robot away. If he could get it into operation, the museum could wait. The re-creation of Man came first!

Senthree pulled X-ray lenses out of a pouch and replaced the normal ones in his eyes before going over to join the robots who were beginning dissection. Then he switched them for the neutrino-detector lenses that had made this work possible. The neutrino was the only particle that could penetrate the delicate protoplasmic cells without ruining them and yet permit the necessary millions of times magnification. It was a fuzzy image,

since the neutrino spin made such an insignificant field for the atomic nuclei to work on that few were deflected. But through them, he could see the vague outlines of the pattern within the cells. It was as they had designed the original cell—there had been no reshuffling of genes in handling. He switched to his micromike hands and began the delicate work of tracing down the neurone connections. There was only an occasional mutter as one of the robots beside him switched to some new investigation.

The female should have lived! But somewhere, in spite of all their care, she had died. And now the male was dying. Eleven couples—eleven failures. Senthree was no nearer finding the creators of his race than he had been centuries before.

Then the radio in his head buzzed its warning and he let it cut in, straightening from his work. "Senthree."

"The director is in your office. Will you report at once?"

"Damn!" The word had no meaning, but it was strangely satisfying at times. What did old Emptinine want . . . or wait again, there'd been a selection while he was on Venus investigating the rumors of Man. Some young administrator—Arpeten—had the job now.

Ceofor looked up guiltily, obviously having tuned in. "I should have warned you. We got word three days ago he was coming, but forgot it in

reviving the couple. Trouble?"

Senthree shrugged, screwing his normal lenses back in and trading to the regular hands. They couldn't have found out about the antique robot. That had been seen by nobody else. It was probably just sheer curiosity over some rumor they were reviving the couple. If his appropriation hadn't been about exhausted, Senthree would have told him where to go; but now was hardly the time, with a failure on one hand and a low credit balance on the other. He polished his new head quickly with the aid of one of the walls for a mirror and headed toward his office.

But Arpeten was smiling. He got to his feet as the biolab chief entered, holding out a well-polished hand. "Dr. Senthree. Delighted. And you've got an interesting place here. I've already seen most of it. And that pig—they tell me it's a descendant of a boar out of your test tubes."

"Incubation wombs. But you're right—the seventy-second generation."

"Fascinating." Arpeten must have been reading too much of that book of "Proven Points to Popularity" they'd dug up in the ruins of Hudson ten years before, but it had worked. He was the director. "But tell me. Just what good are pigs?"

Senthree grinned, in spite of himself. "Nobody knows. Men apparently kept a lot of them, but so far

as I can see they are completely useless. They're clever, in a way. But I don't think they were pets. Just another mystery."

"Um-m-m. Like men. Maybe you can tell me what good Man will be. I've been curious about that after seeing your appropriations since you opened here. But nobody can answer."

"It's in the records," Senthree told him sharply. Then he modified his voice carefully. "How well do you know your history? I mean about the beginning."

"Well—"

He probably knew some of it, Senthree thought. They all got part of it as legends. He leaned back in his seat now, though, as the biochemist began the old tale of the beginning as they knew it. They knew that there had been Man a million years before them. And somebody—Asimov or Asenion, the record wasn't quite clear—had apparently created the first robot. They had improved it up to about the present level. Then there had been some kind of a contest in which violent forces had ruined the factories, most of the robots, and nearly all of the Men. It was believed from the fragmentary records that a biological weapon had killed the rest of Man, leaving only the robots.

Those first robots, as they were now known, had had to start on a ruined world from scratch—a world where mines were exhausted, and factories were gone. They'd learned to

get metals from the seas, and had spent years and centuries slowly rebuilding the machines to build new robots. There had been only two of them when the task was finished, and they had barely time enough to run one new robot off and educate him sketchily. Then they had discharged finally, and he had taken up rebuilding the race. It was almost like beginning with no history and no science. Twenty millennia had passed before they began to rebuild a civilization of their own.

"But why did Man die?" Senthree asked. "That's part of the question. And are we going to do the same? We know we are similar to Man. Did he change himself in some way that ruined him? Can we change ourselves safely? You know that there are a thousand ways we could improve ourselves. We could add antigravity, and get rid of our cumbersome vehicles. We could add more arms. We could eliminate our useless mouths and talk by radio. We could add new circuits to our brains. But we don't dare. One school says that nobody can build a better race than itself, so Man must have been better than we are—and if he made us this way, there was a reason. Even if the psychologists can't understand some of the circuits in our brains, they don't dare touch them.

"We're expanding through the universe—but we can't even change ourselves to fit the new planets? And

until we can find the reasons for Man's disappearance, that makes good sense. We know he was planning to change himself. We have bits of evidence. And he's dead. To make it worse, we have whole reels of education tape that probably has all the answers—but it's keyed to Man's brain, and we can't respond to it. Give us a viable Man, and he can interpret that. Or we can find out by comparison what we can and cannot do. I maintain we can do a lot."

Arpeten shook his head doubtfully. "I suppose you think you know why he died!"

"I think so, yes. Instinct! That's a built-in reaction, an unlearned thought. Man had it. If a man heard a rattle-snake, he left the place in a hurry, even though he'd never heard it before. Response to that sound was built into him. No tape impressed it, and no experience was needed. We know the instincts of some of the animals, too—and one of them is to struggle and kill—like the ants who kill each other off. I think Man did just that. He couldn't get rid of his instincts when they were no longer needed, and they killed him. He *should* have changed—and we can change. But I can't tell that from animals. I need intelligent life, to see whether instinct or intelligence will dominate. And robots don't have instincts—I've looked for even one sign of something not learned individually,

and can't find it. It's the one basic difference between us. Don't you see, Man is the whole key to our problem of whether we can change or not without risking extermination?"

"Um-m-m." The director sounded noncommittal. "Interesting theory. But how are you going to know you have Man?"

Senthree stared at the robot with more respect. He tried to explain, but he had never been as sure of that himself as he might. Theoretically, they had bones and bits of preserved tissue. They had examined the gene pattern of these, having learned that the cells of the individual contain the same pattern as that of the zygote. And they had other guides—man's achievements, bits of his literature. From these, some working theories could be made. But he couldn't be quite sure—they'd never really known whether man's pigment was dark brown, pinkish orange, white, or what; the records they had seemed to disagree on this.

"We'll know when we get an intelligent animal with instinct," he said at last. "It won't matter exactly whether he is completely like Man or not. At least it will give us a check on things we must know. Until then, we'll have to go on trying. You might as well know that the last experiment failed, though it was closer. But in another hundred years—"

"So." Arpeten's face became bland, but he avoided the look of Senthree. "I'm afraid not. At least for a while.

That's what I came about, you know. We've just had word of several new planets around Arcturus, and it will take the major allocation of our funds to colonize these. New robots must be built, new ships . . . oh, you know. And we're retrenching a bit on other things. Of course, if you'd succeeded . . . but perhaps it's better you failed. You know how the sentiment against reviving Man has grown."

Senthree growled bitterly. He'd seen how it was carefully nurtured—though he had to admit it seemed to be easy to create. Apparently most of the robots were afraid of Man—felt he would again take over, or something. Superstitious fools.

"How much longer?" he asked.

"Oh, we won't cut back what you have, Dr. Senthree. But I'm afraid we simply can't allocate more funds. When this is finished, I was hoping to make you biological investigator, incidentally, on one of the planets. There'll be work enough . . . Well, it was a pleasure." He shook hands again, and walked out, his back a gleaming ramrod of efficiency and effectiveness.

Senthree turned back, his new body no longer moving easily. It could already feel the harsh sands and unknown chemical poisons of investigating a new planet—the futile, empty carding of new life that could have no real purpose to the robots. No more appropriations! And they had barely

enough funds to meet the current bills.

Four hundred years—and a ship to Arcturus had ended it in three months. Instinct, he thought again—given life with intelligence and instinct together for one year, and he could settle half the problems of his race, perhaps. But robots could not have instincts. Fifty years of study had proven that.

Beswun threw up a hand in greeting as he returned, and he saw that the dissection was nearly complete, while the antique robot was activated. A hinge on its ludicrous jaw was moving, and rough, grating words were coming out. Senthree turned to the dissecting bench, and then swung back as he heard them.

"Wrong . . . wrong," it was muttering. "Can not live. Is not good brain. No pineal. Medulla good, but not good cerebrum. Fissures wrong. Maybe pituitary disfunction? No. How can be?" It probed doubtfully and set the brain aside. "Mutation maybe. Very bad. Need Milliken mike. See nucleus of cells. Maybe just freak, maybe new disease."

Senthree's fingers were taut and stiff as he fished into his bag and came out with a set of lenses. Beswun shook his head and made a waiting sign. He went out at a run, to come back shortly with a few bits of metal and the shavings from machining still on his hands. "Won't fit—but these adapters should do it. There, 324MD2991. Now come over here where you can look at it over this

table—that's where the . . . uh, rays are."

He turned back, and Senthree saw that a fine wire ran from one dapter. "He doesn't speak our bio-terminology, Senthree. We'll have to see the same things he does. There—we can watch it on the screen. Now, 324MD2991, you tell us what is wrong and point it out. Are your hands steady enough for that?"

"Hands one-billionth inch accurate," the robot creaked. It was a meaningless noise, though they had found the unit of measure mentioned. But whatever it meant, the hands were steady enough. The microprobe began touching shadowy bunches of atoms, droning and grating.

"Freak. Very bad freak. How he lived? Ketone—no ketone there. Not understand. How he live?"

Ceofor dashed for their chromosome blanks and began lettering in the complex symbols they used. For a second, Senthree hesitated, then he caught fire and began making notes along with his assistant. It seemed to take hours; it probably did. The old robot had his memory intact, but there were no quick ways for him to communicate. And at last, the antique grunted in disgust and turned his back on them. Beswun pulled a switch.

"He expects to be discharged when not in use. Crazy, isn't it?" the physicist explained. "Look, Boss, am I wrong, or isn't that close to what we



did on the eleventh couple?"

"Only a few genes different in three chromosomes. We *were* close. But . . . um-m-m, that's ridiculous. Look at all the brain tissue he'd have—and a lot of it unconnected. And here—that would put an extra piece on where big and little intestines join—a perfect focal point for infection. It isn't efficient biological engineering. And yet most animals do have just that kind of engineering. I think the old robot was right—this would be Man!"

He looked at their excited faces, and his shoulders slumped. "But there isn't time. Not even time to make a zygote and see what it would look like. Our appropriations won't come through."

It should have been a bombshell, but he saw at once that they had already guessed it. Ceofor stood up slowly.

"We can take a look, Boss. We've got the sperm from the male that failed—all we have to do is modify those three, instead of making up a whole cell. We might as well have some fun before we go out looking for sand fleas that secrete hydrofluoric acid and menace our colonies. Come on, even in your new body I'll beat you to a finished cell!"

Senthree grinned ruefully, but he moved toward the creation booth. His hands snapped on the little time field out of pure habit as he found a perfect cell. The little field would slow time almost to zero within its limits, and keep any damage from occurring while he worked. It made his own work difficult, since he had to force the probe against that, but it was insulated to some extent by other fields.

Then his hands took over. For a time he worked and thought, but the feeling of the protoplasm came into them, and his hands were almost one with the life-stuff, sensing its tiny responses, inserting another link onto

a chain, supplanting an atom of hydrogen with one of the hydroxyl radicals, wielding all the delicate chemical manipulation. He removed the defective genes and gently inserted the correct ones. Four hundred years of this work lay behind him—work he had loved, work which had meant the possible evolution of his race into all it might be.

It had become instinct to him—instinct in only a colloquial sense, however; this was learned response, and real instinct lay deeper than that, so deep that no reason could overcome it and that it was automatic even the first time. Only Man had had instinct and intelligence—stored somehow in this tiny cell that lay within the time field.

He stepped out, just as Ceofor was drawing back in a dead heat. But the younger robot inspected Senthree's cell, and nodded. "Less disturbance and a neater job on the nucleus—I can't see where you pierced the wall. Well, if we had thirty years—even twenty—we could have Man again—or a race. Yours is male and mine female. But there's no time. Shall I leave the time field on?"

Senthree started to nod.

Then he swung to Beswun. "The time field! Can it be reversed?"

"You mean to speed time up within it? No, not with that model. Take a bigger one. I could build you one in half an hour. But who'd want to speed up time with all the troubles you'd

get? How much?"

"Ten thousand—or at least seven thousand times! The period is up to-morrow when disbursements have to be made. I want twenty years in a day."

Beswun shook his head. "No. That's what I was afraid of. Figure it this way: you speed things up ten thousand times and that means the molecules in there speed up just that much, literally. Now, 273° times ten thousand—and you have more than two million degrees of temperature. And those molecules have energy! They come busting out of there. No, can't be done."

"How much can you do?" Senthree demanded.

Beswun considered. "Ten times—maybe no more than nine. That gives you all the refractories would handle, if we set it up down in the old pit under the building—you know, where they had the annealing oven."

It wasn't enough; it would still take two years. Senthree dropped onto a seat, vagrantly wondering again how this queer brain of his that the psychologists studied futilely could make him feel tired when his body could have no fatigue. It was probably one of those odd circuits they didn't dare touch.

"Of course, you could use four fields," Beswun stated slowly. "Big one outside, smaller one, still smaller, and smallest inside that. Fourth power

of nine is about sixty-six hundred. That's close—raise that nine a little and you'd have your twenty years in a day. By the time it leaked from field to field, it wouldn't matter. Take a couple of hours."

"Not if you get your materials together and build each shell inside the other—you'll be operating faster each step then," Ceofor shouted. "Somebody'll have to go in and stay there a couple of our minutes toward the end to attach the educator tapes—and to revive the couple!"

"Take power," Beswun warned.

Senthree shrugged. Let it. If the funds they had wouldn't cover it, the directorate would have to make it up, once it was used. Besides, once Man was created, they couldn't fold up the biolabs. "I'll go in," he suggested.

"My job," Ceofor told him flatly. "You won the contest in putting the cells right."

Senthree gave in reluctantly, largely because the younger robot had more experience than he did. He watched Beswun assemble the complicated net of wires and become a blur as he seemed to toss the second net together almost instantly. The biochemist couldn't see the third go up—it was suddenly there, and Beswun was coming out as it flashed into existence. He held up four fingers, indicating all nets were working.

Ceofor dashed in with the precious cells for the prepared incubators that would nurture the bodies until ma-

turity, when they would be ready for the educators. His body seemed to blurr, jerk, and disappear. And almost at once he was back.

Senthree stood watching for a moment more, but there was nothing to see. He hesitated again, then turned and moved out of the building. Across the street lay his little lodging place, where he could relax with his precious two books—almost complete—that had once been printed by Man. Tonight he would study that strange bit of Man's history entitled "Gather, Darkness," with its odd indications of a science that Man had once had which had surpassed even that of the robots now. It was pleasanter than the incomprehensibility of the mysterious one titled "Mein Kampf." He'd let his power idle, and mull over it, and consider again the odd behavior of male and female who made such a complicated business of mating. That was probably more instinct—Man, it seemed, was filled with instincts.

For a long time, though, he sat quietly with the book on his lap, wondering what it would be like to have instincts. There must be many unpleasant things about it. But there were also suggestions that it could be pleasant. Well, he'd soon know by observation, even though he could never experience it. Man should have implanted one instinct in a robot's brain, at least, just to show what it was like.

He called the lab once, and Ceofor reported that all was doing nicely, and that both children were looking quite well. Outside the window, Senthree heard a group go by, discussing the latest bits of news on the Arcturus expedition. At least in that, man had failed to equal the robots. He had somehow died before he could find the trick of using identity exchange to overcome the limitation imposed by the speed of light.

Finally he fell to making up a speech that he could deliver to the director, Arpeten, when success was in his hands. It must be very short—something that would stick in the robot's mind for weeks, but carrying everything a scientist could feel on proving that those who opposed him were wrong. Let's see—

The buzzer on the telescreen cut through his thoughts, and he flipped it on to see Ceofor's face looking out. Senthree's spirits dropped abruptly as he stared at the younger robot.

"Failure? No!"

The other shook his head. "No. At least, I don't know. I couldn't give them full education. Maybe the tape was uncomfortable. They took a lot of it, but the male tore his helmet off and took the girl's off. Now they just sit there, rubbing their heads and staring around."

He paused, and the little darkened ridges of plastic over his eyes tensed. "The time speed-up is off. But I

didn't know what to do."

"Let them alone until I get there. If it hurts them, we can give them the rest of it later. How are they otherwise?"

"I don't know. They look all right, Boss." Ceofor hesitated, and his voice dropped. "Boss, I don't like it. There's something wrong here. I can't quite figure out what it is, but it isn't the way I expected. Hey, the male just pushed the female off her seat. Do you think their destructive instinct—No, she's sitting down on the floor now, with her head against him, and holding one of his hands. Wasn't that part of the mating ritual in one of the books?"

Senthree started to agree, a bit of a smile coming onto his face. It looked as if instinct were already in operation.

But a strange voice cut him off. "Hey, you robots. When do we eat around here?"

They could talk! It must have been the male. And if it wasn't the polite thanks and gratitude Senthree had expected, that didn't matter. There had been all kinds of Men in the books, and some were polite while others were crude. Perhaps forced education from the tapes without fuller social experience was responsible for that. But it would all adjust in time.

He started to turn back to Ceofor, but the younger robot was no longer there, and the screen looked out on a

blank wall. Senthree could hear the loud voice crying out again, rough and harsh, and there was a shrill, whining sound that might be the female. The two voices blended with the vague mutter of robot voices until he could not make out the words.

He wasted no time in trying. He was already out in the street and heading toward the labs. Instinct—the male had already shown instinct, and the female had responded. They would have to be slow with the couple at first, of course—but the whole answer to the robot problem lay at hand. It would only take a little time and patience now. Let Arpeten sneer, and let the world dote on the Arcturus explorers. Today, biochemistry had been crowned king with the magic of intelligence combined with instinct as its power.

Ceofor came out of the lab at a run with another robot behind him. The young robot looked dazed, and there was another emotion Senthree could not place. The older biochemist nodded, and the younger one waved quickly. "Can't stop now. They're hungry." He was gone at full speed.

Senthree realized suddenly that no adequate supply of fruit and vegetables had been provided, and he hadn't even known how often Man had to eat. Or exactly what. Luckily, Ceofor was taking care of that.

He went down the hall, hearing a tumult of voices, with robots apparently spread about on various

kinds of hasty business. The main lab where the couple was seemed quiet. Senthree hesitated at the door, wondering how to address them. There must be no questioning now. Today he would not force himself on them, nor expect them to understand his purposes. He must welcome them and make them feel at ease in this world, so strange to them with their prehistoric tape education. It would be hard at first to adjust to a world of only robots, with no other Man people. The matter of instinct that had taken so long could wait a few days more.

The door opened in front of him and he stepped into the lab, his eyes

turning to the low table where they sat. They looked healthy, and there was no sign of misery or uncertainty that he could see, though he could not be sure of that until he knew them better. He could not even be sure it was a scowl on the male's face as the Man turned and looked at him.

"Another one, eh? O.K., come up here. What you want?"

Then Senthree no longer wondered how to address the Man. He bowed low as he approached them, and instinct made his voice low and apologetic as he answered.

"Nothing, Master. Only to serve you."

He waited expectantly.

THE END

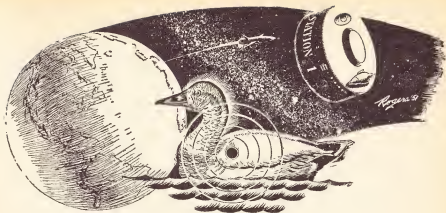
IN TIMES TO COME

William Tenn, too long absent from these pages, is back next month with a feature novelette, "Firewater." Van Dongen did the cover; I'm planning on sneaking the original home for my recreation room. One of the most enchanting bingers you ever saw, carousing happily three feet off the ground . . .

Which is in keeping with the yarn, too, because the "Firewater" of the story, the binge the above-mentioned binger is on, is an exceedingly intellectual one. What happens when a vastly alien people impinges on Mankind? Superior? Inferior? Rational? Irrational? How can you tell, when the Difference is so great it shocks every sane mind that begins to understand it into something half-alien, half-insane, and wholly inhuman? And what do you do about it, when the aliens from the stars *can't* be excluded?

A fine, fancy yarn!

THE EDITOR



SITTING DUCK

BY OLIVER SAARI

***Agoraphobia**, I understand, is the fear of having no place to hide. Man's arboreal, basically; heights shouldn't bother him, even a height of two thousand miles. But it's horribly open up there . . .*

Illustrated by Rogers

The last half of the twentieth century saw the Human Race spiraling dizzily toward a nervous breakdown. Governments were playing a game, with civilization itself at stake. The "squares" of this colossal game were the nations that covered the face of the world, and the pawns were men. As in the gentler game of chess, the moves in the international game were aimed at getting the pieces into positions of power—both political and military. In the latter sense, Space "Sta-

tion Number One could have been called "King's Row"!

The Station was a fifty-foot metal hockey puck that slid noiselessly across the void a thousand miles above the Earth's surface. It had cost over a billion dollars and twenty-four human lives to assemble out there in space—but without a crew it was just another insignificant and worthless satellite. Where, in these times of jangled nerves, could be found the men to live in and operate the

station? To live six months in constant danger, in a most weird and cramped environment, carrying on unprecedented load of responsibility: this was a lot to ask of four men, four tiny nuggets to balance all the power in a world tottering on the edge of catastrophe. They were three men and a Commanding Officer, mere mortals transformed into Gods! They were chosen with the utmost care, but mistakes, as always, were inevitable—

From "A Short History of the Nervous Years," Volume 1

"... This concludes the message of the President of the United States," the radio said. "Stand by for periodic news reports. The next hour will be given over to the Office of Civilian Defense, the subject to be 'A Review of Important Rules for Survival in Case of Atomic Attack.'"

Snell turned the radio off with a savage sweep of his hand. For ten years the public had been told what to do in case of atomic attack. It looked as though they could soon put their learning to use!

A thick silence filled the recreation room. Carlin and Bailey sat staring at a chess board; Snell had been watching them from the corner of his eye and knew they hadn't made a move for an hour. Carlin's face was expressionless, only a slight twitching of a cheek muscle showing tension—the tension shared by all of them. Carlin was a veteran of three months—he was all

right. Bailey, on the other hand—

His face was white, his lips drawn in a purplish line across his narrow countenance. Free-fall sickness again. Snell's lip curled slightly before he could control it.

"You look bad, Bailey," he said, trying to make his voice sound friendly. "You're due on watch in five minutes. Think you can make it?"

"Sure," said Bailey, straightening up with an effort. "I'm all right. It's just this stomach of mine again."

"It's apt to be a bad time," Snell said. "You heard what the President said. The next three or four hours might see the big break."

"I won't fall asleep, if that's what you mean," said Bailey.

Snell felt his mind groping for the right words to say what he wanted to express. He didn't want to be unnecessarily hard on Bailey, but the urgency of the present situation didn't allow him to take a chance. Human feelings had to make way for duty. As Commanding Officer, it was his duty to see that the Station was ready for the coming crisis.

"I'll take over your watch this time, Bailey," he said with sudden determination. "You don't look well. Better turn in."

Bailey's long fingers gripped the edge of the table with a convulsive motion. He opened his mouth twice as if to speak, but couldn't find the words. His eyes were wide open and full of an expression Snell couldn't

quite understand. *Weakling—coward*, Snell thought. *You're glad, aren't you, and you haven't got the guts to say it!*

"You're the boss," said Bailey finally. "Only let's remember that I didn't ask for this—that I'm able to go it alone."

"Sure, we'll remember," Snell said, fighting back an unexplainable anger. "It isn't your fault you're sick. But *turn in*. That's an order."

He turned quickly and nudged himself toward the open end of the tube leading to the Earthside radome, struggling to keep from showing his anger to the others. Anger at what? He would have liked to be more specific about it; his code of self-discipline didn't allow him to feel an unreasoning hatred. He decided it was anger at the army psychological staff, with their silly little tests and "personality indexes." Anger at the Brass Hats down at New Mexico Base for sending a schoolboy to do a man's job! Snell knew he felt a fear and hatred of the weakness Bailey had brought to the Station—*his* Station. And he felt an urgent need to do something about it.

He gave these thoughts free rein as he pulled himself savagely along the radial tube leading to the radome. But his face was stern and composed by the time he emerged in the transparent bubble that disclosed the vast and slowly-curving face of Earth. Rinaldi was there, peering into the eyepieces of the infrared viewer. He looked up as

Snell entered, his black brows moving up in an unspoken question.

"Bailey's sick," explained Snell. "I'm taking his watch. Where are we?"

"Just passed Warsaw. I had Moscow in the infrascopes. No activity."

Fascinated as always, Snell looked down at the looming planet. Ahead—in the direction he knew the Station was moving—the Urals pushed their snowy peaks past scattered cloud formations. To one side were the Black Sea and the Mediterranean, and beyond them at the rim of Earth was the mighty Sahara. The opposite horizon was white and misty—Greenland! In between was the squatting green rabbit of Great Britain, almost lost in the azure background of the Atlantic. It gave Snell a sense of strength and of power to realize that his one sweeping glance covered more than the Romans and Greeks had known of the entire world.

"You heard the radio?" he asked Rinaldi.

The other nodded, his eyes passing habitually over the two hemispherical radar screens, whose three-dimensional sweep covered the space around the Station.

"Same old stuff," said Rinaldi. "If anything comes of it this time, we'll be the first to know."

"We've got to be the first to know," said Snell grimly.

A flicker of something unguessable passed in Rinaldi's almond eyes.

"About Bailey," he said, "what's the matter? How bad is he?"

"Oh . . . the usual thing. Free-fall sickness," said Snell, shrugging it off. Did Rinaldi guess his thoughts about Bailey? Fear was infectious, and cooped up the way they all were, there was no possible quarantine. Was Bailey's fear affecting the others? Snell thought he'd seen signs of this. Suddenly the thought that had been forming in the back of his mind came to the fore. He knew what had to be done; there was no other way.

"In an hour and twenty minutes we'll be in beam range of New Mexico Base," he said to Rinaldi. "If nothing pops before then, stand by to send a message, top urgent."

After Rinaldi had gone, he made a systematic round of observations with all the instruments, tested the range finder and rocket launcher circuits, made one more sweeping examination of Earth rolling by below—and started to compose the message in his mind.

He had just about decided on what to say when he heard a rustling noise in the entrance tube. It was Bailey, pulling himself in and strapping himself into the other observation seat, avoiding Snell's eyes. There was no change in the expression on his face: he looked sicker, if anything.

"I thought I told you to turn in," said Snell nastily.

"I know, but—I feel a lot better now. I'd like to stand my watch."

Snell's lip curled again, this time

more visibly. He knew why Bailey wanted to stand his watch. The man was scared stiff! He couldn't bear to lie in a dark little cubicle and wait for whatever was coming. He wanted to be up here where he could see Earth, where he'd have a chance to see what hit him.

Snell made a point of methodically checking all the instruments again. Then he said: "All right, stay a while if you like. I wanted to talk to you alone anyway."

Bailey turned his head to look at the radar screens, then at Earth.

"How does it look now?" he said.

Snell shrugged his shoulders in pretended casualness. "Not a thing yet."

They sat for a while in strained silence.

"Tell me something, Bailey," said Snell suddenly, almost in a friendly tone. "How did a man like you—a scientist—happen to volunteer for this duty?"

Bailey looked surprised. Obviously he hadn't expected a question of that sort.

"Why, that's just the reason," he said eagerly. "Any scientist would give his left eye for a post up here! This Station can be a flying lab that beats anything possible on Earth. One small telescope here is worth a hundred at Palomar. The spectroscopic and cosmic ray data is priceless, and—"

"You seem unaware," interrupted Snell harshly, "that the Space Station is a military outpost, *not* a flying

laboratory."

"That's where the Brass are making their mistake," said Bailey earnestly, new strength in his voice—the strength of a man waging an argument he believes in. "They're concentrating too much on the immediate and obvious military values—they're not looking at the long-range picture. Why, any physicist on Earth would give both his legs for a cubic inch of the hard vacuum that we've got miles of outside. I've already got a clue on radial cathode emissions that looks *hot*. I only wish—"

"You didn't understand me," Snell cut in. "I've no argument with your spare-time scientific work. But I feel that you are . . . uh . . . physically unsuited for the military responsibilities of this Station."

Bailey's body stiffened, tightening the straps that held him in his seat.

"I've been sick, yes," he said evenly. "But that hasn't prevented me from doing what you consider to be my duty."

"Nevertheless," said Snell, "I feel . . . I hate to say this . . . but I feel that I can't endanger the military potential of the Station any longer by permitting you to remain here."

"You mean you're going to ask for a replacement for me?" Bailey almost shouted, red anger displacing the usual whiteness of his face.

Snell nodded. "I'm asking for him in our next contact with New Mexico Base. I'm sending the message top

urgent, for reasons of health and immediate necessity. I hope I can add your endorsement to that message."

Bailey's reaction rather surprised Snell. He'd expected the man to be glad, and to have some difficulty keeping from showing it. That would have been the reaction consistent with what Snell thought of his character. Instead, Bailey was crushed and on the verge of tears. He started to speak twice, but was unable to force out the words.

"I think you're making a mistake, major," he said finally. "I pointed four years toward this job! I passed all their tests, went through a year of military training, just to get a chance to come up here. I don't feel that I—"

"You still don't understand," Snell cut in. "Personal considerations don't enter into this thing at all. I feel that your being here endangers the Station, that's all."

For an instant he thought Bailey was going to hit him. The man looked ridiculous, with his long, slender fingers clenched into bony fists and his eyes full of helplessness and anger. The eyes surprised Snell; they weren't the eyes of a coward, but contained something deep, something he hadn't expected to see. But his mind was made up.

"You know they have a rocket ready for this sort of emergency," he went on rapidly. "The request for your replacement will be sent, *with or without your endorsement*. Be ready to

leave in forty-eight hours."

Bailey tried a new angle. "Isn't this a risky thing to do just now, with things the way they are down below?" he ventured. "You heard what the President said—"

"Exactly why I'm doing it," snapped Snell. "Now—you'd better get some rest. You'll need all your strength to wrestle with gravity again!"

After Bailey had gone, Snell sat staring idly at Earth below, at the familiar outlines of the China Sea, at Australia with its brown, cloudless wastelands—His thoughts were in a turmoil. A part of his mind told him he was attaching too much importance to this Bailey affair; and yet he couldn't think about anything else. From the very first it had been like that—from the time Bailey had arrived at the Station, four weeks ago. Snell remembered his first impression and his thought: *He's just a scared kid! Couldn't they do any better with all their testing and screening—especially now?*

Bailey was twenty-nine, but boyish-looking and so thin and tall he took up all the height-adjustment of his spacesuit. Snell made a conscious effort to avoid snap-judgment on first impressions, but he was aware of a deep disappointment. He'd expected a little more—what? Maturity, perhaps. Then he remembered Bailey had a Ph.D. in physics.

That's it, he thought, pressure from the scientific gang. They've been hollering

for more basic research data from up here. Well, they could have picked a better time to send me one of their school-kids!

Bailey had removed his helmet, with the aid of the grinning and frankly curious Rinaldi.

"Captain Bailey reporting—" he started to say, trying a clumsy salute. The motion sent him floating across the compartment. With no attempt to hide his amusement, the swarthy Rinaldi moved his flippered feet expertly and swam through air to reach the struggling newcomer and bring him to anchor.

"No need for formalities here," said Snell curtly, not amused. "You'll find it more useful to learn to swim than salute."

Bailey's face was white; he looked as though he were about to vomit.

"Yes, major," he said, trying to climb out of his spacesuit without letting go his desperate grip on the hand-rail.

"Make yourself at home," said Snell, trying to compose his face into what he imagined to be a friendly expression. "Rinaldi, show Captain Bailey around. Oh, yes . . . uh . . . Captain Bailey, this is Lieutenant Rinaldi, our Communications Officer."

That was the way it had begun. Snell had felt a sick worry, looking at Bailey. The new man violated his sense of military decorum; he was so obviously unmilitary—weak. How had the tests failed? Couldn't they tell by



just *looking* at him that Bailey was not suited for duty in the Station?

Snell had immediately sent several tersely-worded inquiries concerning Bailey's qualifications, but had received no real satisfaction from the answers. The simple fact remained: New Mexico Base considered Bailey the most suitable replacement they had available, and it was up to the Commanding Officer to use him.

Bailey was married, as were the other members of the crew, except Snell himself. She looked good in pictures, pretty by any standards. Of the three wives, she was Snell's favorite. Rinaldi's was fat and dark and talked too much, and Carlin's was sleek and sophisticated but not Snell's type. It was ironic that Bailey, the weakest of them all, should have her—

The woman's voice was soft and soothing. Snell could feel his whole body relaxing every time she spoke; his hand would move away from the censor switch and grope to adjust the earphones on his close-cropped head. What *she* said was somebody else's lookout, not his. But he couldn't help listening. The context of her words was lost on him—it was something about how the children were enjoying Indian Summer in Duluth. Snell's thoughts drifted in the softness of her voice. He could almost imagine she was speaking to *him*. •

Bailey's voice in the earphones startled Snell. His hand tensed over the censor switch, ready to cut off the conversation in an instant if he felt military matters touched upon.

"I won at poker today," said

Bailey. "If my luck and Carlin's purse hold out, we can buy that new house."

"Don't you *dare* play anything but penny ante!"

"Don't you worry, Honey," laughed Bailey. "Regulations won't allow heavy gambling, even if you would."

"Isn't there anything else to do up there?"

"Oh—we play weightless handball sometimes, but Carlin and Rinaldi always beat me at that. Poker's the only thing I can win at."

"But what about your work? I should think you could see—"

"The view is fine," Bailey cut in, and Snell was relieved at the banality of the reply. The work of the Space Station was to be discussed only over the tightest beams and in the most reliable code—not in a phone conversation with one's wife.

There was a brief silence at the other end, and for an instant Snell thought the censor at the Earth station had cut her off the air. Then the woman spoke again in a low voice:

"Do you hear . . . radio . . . up there?"

She must have been coached not to mention fears or anxieties. This was her way of asking Bailey, "Are you afraid, Darling?"

"Sure," said Bailey, "we pick up short wave. It's the same old stuff. Don't you worry about a thing!"

Bailey's tone was one of superficial confidence and courage, but Snell felt

that his answer to the woman's implied question had been affirmative. Bailey *was* afraid, desperately and dangerously afraid. How long before he would crack? It would, of course, be in the moment of greatest responsibility.

Snell glanced at the chronometer and noted with relief that the time was up.

"Sorry, Folks," he broke in, his voice sounding crisp and unpleasant, even to himself. "The time's up. Fifteen seconds for good-byes."

He listened with mixed emotions to the endearing words, the long-distance kisses. He was conscious of not quite understanding his own feelings, and filed that thought away for future study in the trim, uncluttered cabinets of his brain. At the end of exactly fifteen seconds he threw the cut-off switch.

Snell's belief that Bailey was dangerously afraid received added confirmation one day, from the "Sitting Duck" incident.

Bailey had just come off watch and crawled into the recreation cubicle. His eyes were red and tired-looking from peering into radar screens, infra-scopes, and wide-view Earthside telescopes. Rinaldi had gone to relieve him. Carlin and Snell were playing cards at the perforated table, where a continuous fan-drawn suction created a substitute for gravity. Bailey floated around and watched the game for a while, apparently lost in thought.

"Did anyone ever think," he said suddenly, "of calling this can of ours 'The Sitting Duck'?"

Carlin picked up a card unconcernedly, discarded another, without looking up at Bailey. Snell's reaction was different. His muscles tensed; his eyes bored into Bailey's. He knew what thought was behind that question.

"Why?" he said.

"We're in an orbit that's probably known to fifteen decimal places by every military organization on Earth," said Bailey. "We might just as well be sitting still if anyone wants to gun for us."

"We're got defenses," said Snell, trying to sound confident. He always felt a little foolish when he spoke of the Station's defenses.

"Sure—thirty rockets with atomic warheads, but they're for *Earth* targets. Fifteen smaller rockets to defend ourselves against how many—a hundred? A thousand? As many as anyone on Earth cares to make! We're the only sizable hunk of matter within a thousand miles of this orbit. A few target-seeking rockets sent our way would—"

"We've got radar 'window' for those," Snell pointed out acidly.

"Sorry, I forgot," said Bailey with mock naiveness. "A little tinfoil, against a hundred rockets. We could scatter the first ten, maybe, if we saw them in time!"

"It's up to us to see them on time," said Snell angrily. He didn't like this

kind of talk on board the Station. "That's what we're up here for."

"I thought we were here to spy on the enemy and steer guided missiles."

"I'm glad you know that," said Snell, keeping calm with an effort. "Because the instant a rocket is sent against us, there will be long-range rockets with atomic warheads sent against New York and most of our other cities. The first ones will miss because nobody else has a Space Station to guide them."

"There are two other Space Stations a-building," Bailey pointed out.

"Sure, but ours is the first by at least a couple of years. We can observe and beam a direct signal over forty million square miles—a fifth of the Earth's surface. We can pinpoint our atomic rockets on any point in the world within four hours. We can take over control of missiles sent up from Earth, and drop them on the enemy. I wouldn't say we're defenseless!"

"I'm not saying we can't hit Earth targets," Bailey insisted. "But what about us?"

"It's up to us to observe where the rockets are starting from," snapped Snell. "We've got to steer the answering punch—"

"Before they punch us. *We'll be target Number One!*"

"You knew about this when you volunteered," roared Snell, slamming his fist on the table. "Do you want me to ask for a replacement for you?"

"Why, no!" exclaimed Bailey, flush-

ing and surprised. "I was just thinking out loud."

Carlin made a loud riffling noise with the cards.

"Sitting Duck," he chuckled. "Say, that's pretty good!"

From that moment the name of the Station had been "The Sitting Duck." Carlin and Rinaldi bandied it about and laughed about it, but it irritated Snell far beyond its importance. He admitted to himself that Bailey had been perfectly right in his reasoning—the Station was practically defenseless and vulnerable. It was something they all knew in their hearts, and Bailey had merely put it in words. If it had come from one of the others, Snell might simply have laughed it off. But coming from Bailey he couldn't ignore it.

After that, Snell had known he would have to get rid of Bailey. He had sent messages to New Mexico Base indicating his concern, hinting his dissatisfaction, paving the way for his request. Now the time had come to act.

Snell was aroused from his disturbing reverie by Rinaldi, whose face appeared in the other end of the entrance tube.

"We're getting into beam range of Base," Rinaldi said. "You said you had a message."

Snell threw a startled glance at the chronometer, then at Earth below, at the boundless expanse of the Pacific. It was true! In his preoccupation with

the Bailey affair he had lost track of time. That was the final proof that Bailey's weakness was affecting the efficiency of the Station. He had to go!

"I'm demanding an immediate replacement for Captain Bailey," Snell said.

Rinaldi gave a visible start, then clambered through the tube toward Snell. His face had a peculiar expression; his eyes avoided Snell's.

"Don't you think it's rather risky at this time—" he began in a low voice.

"It's my responsibility!" said Snell sharply. "Take this down and send it: Due to physical disability and general unsuitability for duty on board the Space Station, it is the urgent request of the Commanding Officer that Captain Bailey be replaced immediately."

Snell bit his lips thoughtfully as he studied the rocket's markings: the huge brown-and-gold stars painted on the bulging sides and stubby, swept-back aluminum wings; the sharp break in her lines where stage number two had been jettisoned. He saw the rocket's engine flare briefly blue and shoot a trail of sparks from its carbon steering vanes.

"Looks like ours all right," he said to Carlin, who was peering at the rocket through the other telescope. "But you never can tell. Stand by to give her everything we've got if—"

He left the sentence hanging, knowing it was superfluous. Carlin knew

what to do if that rocket wasn't what it seemed.

Tensely he watched as the little rocket plane, its wings useless in airless space, maneuvered carefully with short firings of its engine. He relaxed a little as he made out the code numbers on her sides. There! That burst ought to do it. No! Cut, you fool, you're wasting fuel. Snell ground his teeth in helpless anger as the rocket overshot the Station, then brought itself into line by swinging on its gyros and firing one more burst.

My God, he thought, can it be another incompetent?

"Guess it's the replacement, all right," he said at last. "I can see the pilot through the visor. Hope he's a better observer than a rocket-jockey! How's Bailey taking it?"

"O.K.," Carlin said with downcast eyes. "He's ready, I guess."

Suddenly Snell felt a tremendous weariness he couldn't explain. His body felt like a ton of lead, even in the weightlessness. His brain clouded over, the filing cabinets spilling out into a jumbled mass out of which only one thought emerged: *If they're sent me another weakling, another one like Bailey, I'll . . . I'll*—The thought became indistinct there. He didn't know what he would do.

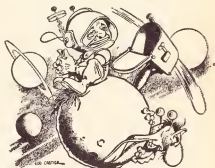
He ripped loose the belt that held him, and dived recklessly through the tube, back into the bowels of the Station, into the air-lock compartment. Bailey was there, clad in a spacesuit,

the helmet in his hand. His hair was uncombed, his eyes red. *Go home, little boy*, thought Snell bitterly. *Go home and play with your chemistry set.*

Bailey extended his hand. "No hard feelings, major," he said. "I only wish you hadn't done this. Maybe some day you'll find out you've made a mistake."

Snell ignored the proffered hand. A thought was beating its way into his brain. Why didn't Bailey look glad? He was a coward, and he was going home to safety.

A scraping sound penetrated the metal wall. A gear train whirred behind it, a pump chugged, and air hissed. After five minutes of these



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sounds, the inner door spun open in a puff of vapor, revealing the hoar-crusted, bulging, spacesuited figure inside. The face of the newcomer was hidden by frost on the visor.

The newcomer climbed through the lock and anchored himself expertly on a handhold. As soon as his suit had warmed, he started spinning off his helmet.

He seems to know what he's doing, thought Snell. *Maybe this time—*

"Hello, Snell."

Snell started. The voice was familiar, and so was the face. Brigadier General Johnson, the man Snell himself had relieved four months ago!

"Don't tell me they sent *you* to relieve Bailey!" cried Snell.

"No, major. *I'm here to relieve you.*"

"But, sir, I asked . . . that is—"

The newcomer stretched out a

strong, affectionate arm.

"I understand," he said in soothing tones, as of one addressing a child. "But Headquarters has been analyzing your reports and messages. They've felt for some time that you needed a rest. Your last message convinced them you're a sick man, major."

Snell tore his arm loose from the other's grasp. The motion sent him floating helplessly across the compartment. The injustice of what was happening beat down on him. *He*, a sick man? Impossible! Bailey was the one. Bailey was the coward, not he!

Then, for an instant, reality and reason returned to him with stunning impact. A tremendous sense of release flooded through him. The problem wasn't his.

He was glad. *His* face showed it.

THE END.

THE ANALYTICAL LABORATORY

The Lab this time is unique; it's been very solidly bunched into a tight knot, with two ends hanging out! For the benefit of those who don't know the system we work on, letters from readers are checked, and each story voted for gets a score-point in order of the reader's placement thereof. A story voted first, gets one point; the story voted fourth best gets four points. The resultant point scores are added up, then divided by the number of votes cast, and the resultant figure is the "point score," and determines the story's Place. The results on the October Issue, however, are:

PLACE	STORY	AUTHOR	POINTS
1.	Iceworld (Pt. 1)	Hal Clement	1.81
2.	Tied: Thinking Machine	H. B. Fyfe	3.00
	The Years Draw Nigh	Lester del Rey	3.00
	Ultima Thule	Eric Frank Russell	3.00
3.	The Head Hunters	Ralph Williams	3.58

And every story got at least one first-place vote, and at least one fifth-place vote! The fact that three stories tied exactly under so wide a range of voting is unique!

THE EDITOR



THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

OVER MY SHOULDER

The publishing schedule of this magazine, as your editor explained in October, is such that the copy for this department must go to him by October 1st with three of the most fruitful months of the publishing year still to come. On the other hand, in an issue dated January, 1952 and appearing on the newsstands just as most of you are girding yourselves for last-minute Christmas shopping, it certainly behooves a reviewer to say something about the highlights of 1951. Perhaps I can look over my shoulder at the nine months that are

gone, without jeopardizing the three to come.

The science-fiction books dated 1951 which I have on hand, piled on the floor, reach just about to my belt-buckle. If I add some October releases which are just in, it will probably make a good five-foot shelf. Nor does this include juveniles, to which we are going to have to devote some attention in a future column, judging by the fall announcements.

In the first place, 1951 has been a year of anthologies—good ones. They had a column to themselves last month, and a few more are reviewed individually in the next few pages. The

Bleiler-Dikty "Best Science Fiction Stories: 1951", out in October, seems to show even greater variety and equally good judgment when compared with its two predecessors, and Gnome's "Travelers in Space" promises to be fabulous. But if you're trying to indoctrinate someone with the glories of good science fiction you can reach almost at random for Conklin, Pratt, Leinster, Crossen, and last spring's Greenberg "theme" collection.

The year has thus far produced six novels written directly for book publication without previous serialization—seven if you include John Campbell's "The Moon is Hell" (Fantasy Press, \$3.00) which makes up nearly two-thirds of the book of the same name. It is a toss-up whether to offer the laurels to William Temple's warmly human treatment of a rather ordinary situation in "Four-Sided Triangle" (Fell, \$2.75) or Sprague de Camp's completely original, poker-faced explanation of how Sex came to a young lady among the egg-laying natives of Ormazd, "Rogue Queen" (Doubleday, \$2.75). Stanley Mullen's "Kinsmen of the Dragon" (Shasta, \$3.50) is a fantastic adventure yarn in Merritt vein, not quite up to the old master. Out of the main trend, Philip Wylie's "The Disappearance" (Rinehart, \$3.50) will hardly hold water scientifically but has a lot to say about the foibles and behavior of mankind and woman-kind, together and separated. "The Moon is Hell" is a top-notch old-

school story in the mood of "Destination Moon"—a swell introductory story for someone who wants his science out in the open—and Jack Williamson has a good run-of-the-mill mutant adventure-mystery in "Dragon's Island" (Simon and Schuster, \$2.50). Theodora DuBois' "Solution T-25" (Doubleday, \$2.75) is a lame-duck hybrid science-fiction-mystery which succeeds in being neither.

There being no water-tight definition of a "classic" in science-fiction, we will limit the label to anything originally published before 1940. Of the three books which qualify, John Taine's "Seeds of Life" (Fantasy Press, \$2.75) is the only one which is unequivocally science-fiction, and that in Taine's best vein. "The Blind Spot," by Austin Hall and Homer Eon Flint (Prime, \$3.50), though verging into occult fantasy, is certainly the collectors' item of the year—thirty years old, never before between boards, and only mildly dated. As for L. Ron Hubbard's two-bagger, "Typewriter in the Sky" and "Fear" (Gnome, \$2.75), there could be nothing less stiff or stodgy and the second of the two novellas will be remembered for a long time. Both are *Unknown* fantasy.

Eight "recent" serials have appeared during the year as novels (there would be more if we reached over the October 1st deadline—two Heinleins, for instance, of which more next month). Most of them are good. It is hard to choose, for instance, among

Raymond F. Jones' "Renaissance" (Gnome, \$2.75) and Eric Frank Russell's "Dreadful Sanctuary" (Fantasy Press, \$2.75) from these pages, Clifford D. Simak's van Vogtian space-time intrigue in "Time and Again" (Simon and Schuster, \$2.50) and the old-master's own rewriting of some of his best and most tangled yarns in "The Weapon Shops of Isher" (Greenberg, \$2.75), or Isaac Asimov's unabashed and smoothly purring space-opera, "The Stars Like Dust" (Doubleday, \$2.50). Up there in top rank, too, is the *Collier's* serial by "John Wyndham," "The Day of the Trifids" (Doubleday, \$2.50). For that matter, you'll find good entertainment, though nothing pretentious, in "The House of Many Worlds" by Sam Merwin, Jr. (Doubleday, \$2.75), with its double-take ending to a fast-moving spy-adventure among worlds, and Edmond Hamilton's "City at World's End" (Fell, \$2.75). Incidentally, among the best buys of this or any year are the Grossett and Dunlap reprints, at \$1.00 each, of a string of top-notch novels which picked up Leiber's "Gather, Darkness!" and Heinlein's "Beyond This Horizon" during 1951. More, I hope, will come. And Shasta has brought out a new edition of John Campbell's "Who Goes There?" (\$3.00) to remind you what might have happened if the motion picture people had played the title story straight in "The Thing."

Campbell's book, however, belongs

with our last category—story collections. Well ahead of the field is Ray Bradbury's "The Illustrated Man" (Doubleday, \$2.75), though it is not up to last year's "Martian Chronicles." Pushing it will be Robert Heinlein's "Green Hills of Earth" (Shasta, \$3.00), due in October, Fredric Brown's "Space on My Hands" (Shasta, \$2.50), and the smoothly written stories in Robert S. Carr's "Beyond Infinity" (Fantasy Press, \$2.75). FPCI (Fantasy Publishing Company, Inc.) has hit the bull's-eye twice, first with Raymond Jones' "The Toymaker" (\$3.00), six stories, five from *Street & Smith* magazines, and Sprague de Camp's "The Undesired Princess" (\$3.00), including "Mr. Arson," both typical fantasies.

If there have been others which I have overlooked, it may be that they have overlooked me: this is, yet, a young department. For an appraisal of the non-fiction offerings, especially Willy Ley's newly rewritten "Rockets, Missiles, and Space Travel" (Viking, \$5.95), Arthur C. Clarke's "Interplanetary Flight" (Harper, \$2.50) and John P. Marbarger's symposium "Space Medicine" (University of Illinois, \$2.00 & \$3.00), you are referred to the November column and to special reviews recently published here or yet to come. Three months from now we'll try another backward look and award a few crowns for the full twelve months of '51.

Meanwhile, a very special message

from your editor. Paramount published a factual booklet on "Destination Moon" which has become a collectors' item. By this time they will have done the same for "When Worlds Collide"—probably an even greater hit. Shoot a post card off at once to B. A. Babb, *in care of this magazine*, asking for a copy of the booklet and you'll get one from a stock which are being held out from the general advertising distribution *while they last*. There will be only twenty-five thousand copies to satisfy one hundred fifty million people. John Campbell has made this arrangement to give you a better break than the chance of one in six thousand you'd normally have of getting this illustrated description of how a great science-fiction movie is made. Need more be said?

DREADFUL SANCTUARY, by Eric Frank Russell. Fantasy Press, Reading, Pa. 1951. 276 pp. \$2.75

There is nothing more frightening than distortion of the familiar. This has been a commonplace with ghost-story writers of the M. R. James school, but it has not been so well realized in science-fiction. Perhaps Dr. David H. Keller was its best exponent in the "good old days", but Dr. Keller is seldom with us now.

Three years ago, in a long serial here in *Astounding Science Fiction*, England's Eric Frank Russell brought us

the story of a business man's efforts to find out why every attempt to send a rocket to the Moon was failing. His search led him to the organization of men who called themselves "Normans"—"Normal Man". They insisted that they were Martian keepers of a planetary insane asylum—our Earth—and that our race of psychopaths must be prevented at all costs from getting back into space and re-contaminating the "clean" stock from which they had been humanely weeded out.

There have been numerous attempts recently to wed detective fiction with science-fiction. "Dreadful Sanctuary" is about the only novel-length success which I have seen to date. It is, moreover, one of the most believable science-fiction books in years. This can happen. Maybe it is happening. Only a slight British flavor to the American idioms betrays its trans-Atlantic source.

"How do you know you're sane?" the Normans asked John Armstrong, hero of this tale. Sane or insane, unless you're convinced that you are a Martian yourself, you'll like his answer.

THE THRONE OF SATURN, by S. Fowler Wright. Arkham House, Sauk City, Wisconsin. 1949. 186 pp. \$3.00

This little collection, which in the author's opinion contains his only good science-fiction short stories, is

one of the few—and good—non-fantasy ventures from August Derleth's pioneering Arkham House. It should have been noted here long since, for the author of "The World Below," "Deluge" and "Dawn," and "The Island of Captain Sparrow"—to name those of his science novels generally known in this country—is equally expert in shorter lengths.

The dozen stories in this book, with the exception of the much-reprinted "The Rat," will be new to most readers. They may remind one of some of Dr. David H. Keller's early thoughts on the outcome of our mechanized culture, but they have a savage bite to them that Dr. Keller never put in his tales. Wry, satiric, cruel—all these adjectives fit, as they fit the mood of Orwell's "1984" or Aldous Huxley's "Ape and Essence". If there is a collective villain in the lot it is Science, taking over management of the world in exasperation and making as brutal a muddle of the job as non-Science.

Wriest of the lot are the first and last stories in the book. "Justice" poses a grimly logical solution to the problem raised as medicine postpones death and saddles the burden of supporting more and more aged relatives on fewer and fewer young people. "Original Sin" is a last-man-on-Earth story with a punch line as cynically pessimistic as the finale of Fredric Brown's "Knock" is happily optimistic.

If you do not object to the quiet

twisting of your values, you will find here imaginative fiction entirely different from anything else you are likely to find in print.

ADVENTURES IN TOMORROW, edited by Kendell Foster Crossen. Greenberg, New York. 1951. 278 pp. \$3.50

A capsule history and appraisal of science fiction, "Houyhnhnms & Company," introduces this excellent selection of fifteen stories originally published between 1933—C. L. Moore's "Shambleau"—and 1951—Ward Moore's "Flying Dutchman," the editor's "Restricted Clientele," and Bruce Elliott's fantasy "The Devil Was Sick." They are organized in four blocks, an "Atomic Age" of 1960–2100 A.D., a "Galactic Age" extending from 2100 to 3000, a "Stellar Age"—surely this should precede the galactic?—from 3000 to 10,000 A.D., and a "Delphic Age"—sheer prophecy—covering the comfortable period from 10,000 to 1,000,000 A.D. Then Stapledon takes over.

Such a collection as this answers very effectively the common criticism that some one story—e.g. Ray Bradbury's "There Will Come Soft Rains"—is too often reprinted. Where there is an intentional order to the stories, as there is here—where there are not so many that the book cannot be read through—the story which produces

the right impression at the right place is the one to use. That seems to have been Mr. Crossen's policy. It has given us such worthwhile discoveries as Walter Van Tilburg Clark's "The Portable Phonograph," and *mirabile dictu!* not one of the fifteen stories appeared first in this magazine.

POSSIBLE WORLDS OF SCIENCE FICTION, edited by Groff Conklin. Vanguard Press, New York. 1951. 372 pp. \$2.95

Groff Conklin's fourth big anthology of science fiction—his fifth, if you include the pocket-size Perma-book collection—is also one of his best. Its selections range through seven magazines and over fifteen years of good story-telling, and for this reader's taste only two of the twenty-two stories do not stand up as top-notch.

There is a structure to the book something like Donald A. Wollheim's less successful "Flight into Space" (Fell, 1950). In the opening section,

"The Solar System," there are twelve tales covering imagined life-forms on the various planets and their satellites. In the second half of the book, "The Galaxy," the authors' imaginations take freer rein to explore the editor's "possible worlds" among the stars. The slightest of the selections are the old-line monster yarns dealing with Mercury—Frank Belknap Long's "Cones"—and Saturn's moon, Dione—D. L. James' "Moon of Delirium"—but with them you get such top-notchers as James H. Schmitz's "Second Night of Summer," Poul Anderson's "The Helping Hand," Sam Merwin's "Exit Line," Clifford Simak's "Limiting Factor," Katherine MacLean's "Contagion," Isaac Asimov's "Not Final," Ray Bradbury's "Asleep in Armageddon," van Vogt's "Enchanted Village," and Heinlein's "Black Pits of Luna," with, as the ads usually say, many more. The table of contents is a veritable "Who's Who" of the currently acceptable great.

SPECIAL REVIEW

THE NATURE OF THE UNIVERSE*
—About 1947 a mysterious group of individuals known to the world only as **THEY** decided that women's clothes should undergo a radical

revision called the New Look. Women were informed that they could either adopt the New Look and be in style or resist and be old fuddy-duddies.

After reading "The Nature of the Universe" I experienced much the same reaction that many women felt

*THE NATURE OF THE UNIVERSE, by Fred Hoyle, Saint John's College, Cambridge—New York: Harper & Brothers, 1950. 142 pages, illustrated, \$2.50.

when the New Look was suddenly thrust upon them. This book which developed from a series of broadcasts delivered about two years ago deals with the New Cosmology—the capitals are the author's. In this case, *THEY* consists of Fred Hoyle of Saint John's College, Cambridge, England, and his associates. Without explicitly saying so it is implied that unless you adopt the New Cosmology you are definitely a back number. Apparently *THEY* have discussed the nature of the Universe at great length, weighed the various alternatives in the balance, and decided that it *must* function in a certain manner. Why? Well, because there just simply isn't any other way that it *can* function.

The style in which the book is written constitutes both its strength and its weakness. Hoyle is a brilliant young cosmologist who in the last ten years or so has made a name for himself by the daring originality of his papers. He knows more about theoretical physics than I could ever learn if I studied every second for the rest of my life. But he has an irritating way of stating the results of his theories as if they were accepted facts. I think this is probably unconscious on his part. In effect, he says here is a subject that is tremendously important to me and he holds your attention because you feel that he could not write with such enthusiasm unless the subject were tremendously important to you, too. In seven short chapters he

tells you about the origin and destiny of the solar system, stars, galaxies, and the Universe. In such a brief space these subjects can barely be touched upon yet you arrive at the end a trifle breathless and dizzy but still feeling that you have been somewhere and retained a good deal regarding the significance of the places you have visited.

An informed reader would certainly gain the impression that astronomers are generally agreed upon the majority of statements made. For example, on Page 26 of the first edition Hoyle states, "When you look at the heavens, how many of the stars you see have planets encircling them and on how many of these planets might living creatures look out on a very similar scene? To give a numerical estimate I would say that rather more than a million stars in the Milky Way possess planets on which you might live without undue discomfort." Now aside from the sun we do not *know* that there is a single star in the Universe with a planet encircling it on which we might live in comfort. Often we find it hard to live in comfort on the planet of the only star that we do know anything about.

Some of Hoyle's remarks besides being arbitrary in tone are curiously worded. Thus in describing a brand new theory of the origin of the lunar craters by Gold which "is almost certainly correct" he speaks of the "lower parts of the Moon." This is

the first time that most of us were aware that our satellite had any such appendages. Incidentally, have Proxima and Alpha Centauri been displaced from their position as the nearest stars to the sun at 4.3 light-years? On Page 53 it is stated that light takes about three years to travel to us from the nearest stars.

The most interesting concept in the New Cosmology is that of the continuous creation of matter in space, an idea which it is said represents the ultimate goal of the book. This assumption is needed to account for the fact that the Universe consists almost entirely of hydrogen. For unless hydrogen is being created continuously to replace that converted into helium it should all have disappeared long ago. Hence the Universe is under the necessity of creating hydrogen in somewhat the same way that the government is compelled to keep issuing new greenbacks to replace those that are worn out. This spontaneous creation of matter out of nothing sounds incredible at first but as Hoyle remarks, is it any less palatable than other ideas of the creation of matter such as the big bang hypothesis, for instance? Where does this created material come from? It does not come from anywhere. Material simply appears — it is created. Or you might think of it as intruding into our space

from another dimension, an idea which was suggested by Jeans twenty-five years ago.

The last chapter contains Hoyle's strictly personal views on the general philosophic issues that come out of his survey of the Universe. Here he never hesitates to meet difficulties head-on. He neither hedges nor does he discuss them in such generalized terms that they cease to have any practical meaning. Instead he gives with simplicity and candor his ideas on man's place in the Universe, the cosmology of the Bible, and survival after death.

"The Nature of the Universe" was originally published in the United States in *Harper's Magazine* where already it has attracted wide comment. The book can be recommended as certainly one of the most interesting and stimulating popular commentaries on cosmology provided it is read with reservation. Hoyle believes that the conception of the Universe described in this book is correct in its main essentials; that our conception of the Universe five hundred years hence will still bear an appreciable resemblance to that of the Universe of today.

I believe that the New Look survived for about two years. The lifetime of the New Cosmology will be . . .

R. S. RICHARDSON

Mount Wilson and
Palomar Observatories

THE END



BRASS TACKS

Dear Mr. Campbell:

Although it is common to assume it, for myself, I am not sure that emotional behavior and logical behavior, can be studied separately. It seems to me this may be one of those misleading dichotomies which cause a lot of trouble until they are recognized as inessential, like the nature-nurture feud of a couple of decades ago.

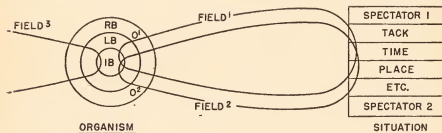
If we take a situation, for example, where a man sits on a tack, we would certainly expect to get an unreasoned response. What we actually get, though, I think can only be understood in terms of field theory.

The man jumps, utters an exclamation,

and shows further activity. The initial pain effect and reflex is probably largely a genetically determined function, but it is also conditioned by learned behavior and reason. The sensitivity to pain seems to depend on general emotional tone and physical health, previous experience with having tacks pushed into that particular area — Indian fakirs, sideshow human pincushions, et cetera and the degree to which the subject logically expects pain. The jump is conditioned by learned patterns of muscle activity and logical factors abstracted from the situation — if the man is a lady, she will probably jump in a ladylike

manner, so as not to expose her legs or disarrange her coiffure. The exclamation is conditioned by the culture in which the man grew up, he will say: "Ouch," "Damn," "Ach," "Ow," "Yi," or "Ugh"; depending on nationality and race. His choice of "Ouch" or "Damn" may also depend on such abstract circumstances as whether there are or are not spectators present, and their degree, age, and sex; as will his subsequent action of sheepish smile or angry frown.

A diagram of the response might look something like this:



- RB — Reasoned Behavior
 - LB — Learned Behavior
 - IB — Instinctive behavior
- } Potential organism
- O¹ — Actual organism selected from potential organism by Field ¹
 - O² — Actual organism selected from potential organism by Field ²

This shows the different but basically similar fields resulting from minor variations in the situation, and indicates that the organism which responds to the situation in Field ¹ is not the same as that which responds to

Field ², and may have little if any resemblance to that which responds to Field ³, though all three are included in the same *potential* organism. The organism is represented in the traditional manner of reasoned behavior superposed on learned behavior which is in turn superposed on instinctive behavior. I do not believe this is, as Korzybski might have put it, a true map, but any graphical representation must necessarily compromise with reality.

The point is that by considering the emotional condition of the subject

alone, we can make no predictions; and by considering the logic of the situation alone (what he "should have done") we can make no predictions; but by considering salient points of the situation (Tack, time, place, et cetera) in conjunction with the make-up of the subject (heredity, sex, nationality, age, et cetera) we can make rough predictions of the reactions to be expected. This is certainly a logical operation, and one we use every day in assessing and predicting the

behavior of our associates — a good check, incidentally, when psychology conflicts with common sense, it is always suspect, in my mind.

In other words, it is the interaction — process — which is important, rather than any one factor in-itself, and what I deplore is over-emphasis on one point at the expense of others. I think instinctive behavior is important, and I think that quite probably with better understanding of our instinctive needs we will be able to tailor a more viable culture, and maybe even a more comfortable one, but I do not feel that we will ever, in the foreseeable future, be able to completely eliminate all conflict and tension, because on both inferential and epistemological grounds it seems to me that conflict and tension are a necessary concomitant of life.

Philosophers and psychiatrists who seek happiness and peace and complete fulfillment as the ultimate ends for the individual or the group are, in my opinion, unconsciously seeking death. The search for Nirvana, I believe, is one of our most important goads to life and activity; but Nirvana itself is death.

To get back to the subject: seventy years ago, all activity was seen in terms of mechanistic response controlled by cold reason, much in the same fashion as a half-broken horse might be controlled by its rider. Because of the normal cultural lag, this is an attitude which still colors most

of our formal social relations — laws, organizational theory, social relations, even the teaching of elementary psychology. Most of the primary texts are pure James at the best, even Freud has a tough time slipping in a few concepts.

In the meantime, the searchlight of really objective inquiry has swung past the opposite extreme of Jungian archetypes and Gestalt theory, and is now beginning to light up the no-man's-land between, where the most fruitful concepts must necessarily lie. What I am afraid of is that while this is going on, too many people will suddenly begin to discover Jung, or bastard versions of Jung, and in the sudden elation of their discovery that man is an animal, they will forget he is a thinking animal.

For example, in tests of animals a normal incidence curve almost always represents the individual variation. This is also true for people, where the test has neutral emotional connotations. Where opinion is involved, however, the curve almost always has a plateau or is distinctly bimodal. Now opinion is something that seems to involve commitment of the whole organism to a definite prejudice. At any rate, it certainly involves emotional responses deeply. But at the same time, the best explanation of this bimodality seems to be that it arises from the logical habit of making decisions which will affect the organism's future, at least they do not appear in

situations where blind choice is involved. Once made, these decisions are so important to the individual emotionally as to autistically color all subsequent thought and action.

In other words, what we feel is conditioned by logical extrapolations from previous experience, and our further thinking is conditioned by what we feel.

What we seem to be getting here might be compared to just what R. S. Richardson complains about in astronomy — turbulence.

We have some nice pat theories concerning laminar flow in behavior — affective and conative mechanisms controlled and guided by cold immutable reason. We call this sanity. We have no nice theories concerning turbulence in behavior, the murky and complex interplay of affect, conation, and concept formation at several simultaneous levels of subconsciousness and consciousness, and we call this type of behavior insanity or irrationality. What we are beginning to discover is that by these definitions almost all behavior is irrational. Laminar flow, in psychology as in physics, seems to be a freak outside the artificial conditions of laboratory experiment or carefully designed airfoils and nozzles.

And our laboratory experiments, set up to measure laminar flow phenomena, seem to have little or no pertinence once we move out of the laboratory.

I do not think very many people understand this even yet, even those doing serious study, but I think it is significant that the emphasis in study is shifting from experimental to clinical methods, and that the emphasis in model-building is shifting from mechanical disassembly and reassembly of ideal specimens to interactions in describable fields. (A reaction which, in itself, I think illustrates my point. The behavior of these people is not "instinctive"; and it certainly is not governed by logical theory, since what theory we have is still experimental; I think these people are reacting unconsciously to a situation in which one approach offers results not attainable in another.) (Not "situationism" either—some people do not react, or react in different ways, the field selects out those whose reaction is viable, in the particular context of the situation.)

I might add to that opinion that I don't think even the most serious students can offer much more, they may be able to fill in detail, but until the mass of detail is structured it is essentially incommunicable and unusable.

I think what the whole field needs is less people to write bulky, obscure books; and more people to spend a lifetime in research which can be condensed into a few simple phrases.

"Day of the Moron," in your September issue, makes a good case history to illustrate some of these points.

When I first read this story, I was inclined to accept the author's logic uncritically, not only because of the normal identification mechanism, but because it does make good sense. I think anyone who must depend on other people to do exacting work has Melroy's attitude almost forced upon them — there are the good Joes you can rely on, and the goofs and psychopaths. You can almost smell them, the impression after even a few minutes of contact is so strong.

Personally, I think the psychopaths are more dangerous, the fools can usually be put in a place where they can't do much harm, and you *can* get a purchase on them, their capacity for group or individual loyalty is frequently high; but the psychopaths are too hard-shelled to contact, and hellishly adept at enlisting the goofs for their dirty work.

This is beside the point, though, and probably a personal prejudice growing out of my own experience.

In the particular situation described by Piper, the point that the dimwits would be dangerous seems well taken; and while I am not well enough acquainted with projective examination methods to know if they could actually be extended to sort out the personalities which can but habitually *don't* think; as well as those who *do* think, but in antisocial terms; the idea sounds plausible.

And that is exactly the trouble, it is too plausible. It is the kind of idea we

are always coming up with when we try to think of people discretely, as static encapsulated structures insulated from their environment. When we look at people this way, they sort themselves out into the good guys and the bad guys. The good guys help us, the bad guys hinder. All we have to do to attain Utopia is to eliminate the bad guys. If everyone is a Sid Keating or a Scott Melroy, breeder reactors never blow up.

The only trouble is, people have been enthusiastically pursuing this sorting technique for millennia, perhaps not with psychological tests, but by magical signs, questions of dogmatic faith, political beliefs, skin color, ideologies, et cetera. And the sad part of it is that there seem to still be just as many bad guys as good guys. Worse yet, too often lately we seem to pour all our energy into liquidating a group of bad guys, and then all of a sudden we find we were mistaken, they aren't bad guys, after all. Ten years ago the Germans were sadistic bullies, the Japs sneaking assassins, the Russians jolly comrades, and the Chinese martyred heroes. Now the Germans (West only) are noble democrats, the Japs loyal minions, the Russians brutal butchers, and the Chinese heathen savages.

(Maybe Nineteen Eighty-Four is closer than we think?)

It almost makes us think, it is so very confusing, that maybe our sorting technique is faulty, despite all the

careful thought we have given it; or maybe even the basic premise is hay-wire.

Going back to "Day of the Moron," perhaps we can re-evaluate the sorting mechanism in terms of field theory, and see if it throws any light.

So we examine it first in the light of a group of men working on a nuclear reactor. From this standpoint it seems sound as a dollar. Burris and Koffler are undoubtedly fools, a danger to their fellow-men, and should be canned. Melroy knows what he is doing.

Unfortunately, however, this is not the entire field we have to deal with. The field also includes a labor union, with certain emotional ties and status systems. It would be nice if it did not include these complicating factors, if we could set up a nice laminar flow experiment in which only the proper functioning of the reactor is important, but then we can't seem to, people and their feelings and other extraneous factors always seem to keep creeping into the picture.

In this field, Burris and Koffler are the good guys, Melroy is a fool, and should have been taken out and shot before he blew up the reactor — for he actually did blow up the reactor, if we look at the whole situation carefully. His extremely inept handling of a delicate labor relations problem — the admittedly necessary, from a technical viewpoint, dismissal of Burris and Koffler — converted a situation in

which the technical operation of the reactor was the chief operator to one in which conflict between labor and management was paramount. The men who reactivated the reactor were primarily intent on using it as a weapon against Melroy, rather than to breed Plutonium. Even Hausinger, presumably one of the good guys, saw the repacking in its context of conflict rather than in its technical context and it apparently did not occur to him to forbid this action on technical grounds, since by that time the attention of all was centered on the conflict — technical operation of the equipment was secondary to this.

In other words, to paraphrase Piper, people put all their eggs in one basket. Melroy was distressed by the fragility of the basket, started to rip out the weak spots, and suddenly found the basket falling apart. Not his fault, obviously, he was only trying to be helpful. Exactly what we might have said about any fool.

The point of all this is that it is meaningless to define a man as a fool, unless we clearly understand in what context he is foolish. A man may be a fool in ninety-nine of one hundred situations encountered, and in the hundredth he may be wise. Similarly, a man may be wise in ninety-nine of one hundred situations, and in the hundredth he may be a fool.

To put it somewhat differently: The fact that a man is a fool or is actively hostile to us in one context does not

mean that he is a bad buy in all contexts.

In practical terms, what this means if we are actually dealing with people is that we have to confine ourselves to the limits of the field in which we are working, or else we have to modify our action to suit the needs of other fields into which we overlap. If we find it necessary to separate a man who is an inefficient worker, this does not justify us in attacking his self-esteem; or if we find it necessary and unavoidable to attack his self-esteem, we need to recognize that we are doing this, and evaluate the situation in human as well as technical terms. If we need to shoot our enemy, we are apt to find ourselves in all sorts of contretemps if we attempt to persuade ourselves we are doing it because he is a bad guy and we are a good guy, instead of for the simple reason that he threatens us, *in the particular situation extant*, and it is more effective to shoot him than to evade him.

In the same way, we will have no occasion to bewail the betrayal of our friends, if we recognize they are our friends only within the limits of a certain field of interaction; nor will we be flabbergasted at the foolishness of our wise men, if we recognize they are only wise in certain things.

The structure of the individual is important; there is observably a wide range in the spectrum of human intelligence and ability; but the individual still operates in certain specific

fields, not in a vacuum, and the other elements of these fields are as important as the make-up of the individual.

Regarding the basic thesis of Piper's story, that the individual's power to harm has been technically strengthened to the point where it seriously overbalances the haphazard social controls we have evolved, I am emphatically in agreement. All the more reason we should understand clearly what is happening in any social situation, instead of fooling ourselves into thinking we can correct the situation by eliminating all the fools. Logical extension of this premise would require elimination of the entire species.

Incidentally, one test of good fiction is that it be faithful to life to the extent that it can be analyzed in this fashion. If well done, it is actually handier than a real-life situation, the irrelevancies are stripped away. I thought this a very good story.
— Ralph W. Slone, McGrath, Alaska.

This letter, while long, I found too interesting to pass up. And Slone's analysis of "Day of the Moron" was far and away the best I've seen.

Dear Mr. Campbell:

The Baltimore Science Fiction Forum was recently faced with the problem of a definition of science fiction. Staff members of the Enoch Pratt Free Library, one of the East's better known libraries, attended the meeting and inquired concerning standards for

science fiction. A proposed club charter required an interest in science fiction for membership. Both sources touched off a debate on what is science fiction. Dr. Oscar Brauner, Ph.D., A.C.S. of 18 E. Preston Street, Baltimore 2, Maryland, gave the following definition: Science fiction deals with sciences and their impact on man during time—Past, Present and Future—in a fictitious way". Acceptance of the definition rests with the club membership.—Allen Newton, Nat. Corr. Sec'y, Balto-S-F Forum, 114 E. 25th Street, Baltimore 18, Maryland.

Anyone with a really good definition of science fiction please step forward! Darned if I can define it to my own full satisfaction!

Dear Mr. Campbell:

The article about meteorite craters by Willy Ley was interesting and informative, but not entirely complete. Mr. Ley refers to the fossil crater at Kentland, Indiana as the only one of its kind, but this is by no means certain.

There are, in the interior lowlands of the United States, about a dozen structures usually called *cryptovolcanos*. They occur at random from Tennessee through Ohio, Indiana, Wisconsin, and Michigan. One of the largest is that of the Wells Creek basin in western Tennessee. No igneous rocks occur in association with them, and they answer the structural re-

quirements of impact craters.

The best description of them is in a publication of the 16th International Geological Congress: "Cryptovolcanic Structures of the United States," by W. H. Bucher. The paper was written in 1936, and ascribes the features to the explosion of volcanic gases. In the intervening years, a large body of geological opinion has formed around the notion of meteorite craters, and my impression is that that is now the current interpretation.—Warren Grabau, P. O. Box 234, Peru, Illinois.

Really well-weathered meteorite craters would be hard to spot!

Dear Sir:

I am writing with a suggestion for a scheme whereby I think your valuable journal could perform a real service to our country and to the world. If you have room to print it, I wonder what your readers will think of my idea.

My suggestion is that you open a competition among readers for the best program of devices for communicating with the powers of the Soviet Empire, especially Russia. Russians under the present regime are not allowed to travel, or to communicate outside their country. So our problem is not *what* message to get to them, but *how* to get a message to them at all. Any news of what we are doing and thinking will interest the ordinary Russian, who is no more politically minded than the ordinary American.

I believe a selection of letters on these lines would be of real interest. Competitors should respect three general conditions. First, nobody must be physically harmed by the methods of communication. In other words, they should be methods that we would be ready to see used against us; if hostile propaganda is going to hurt us, then we are not very sure of our beliefs! Secondly, the program should be unstoppable, even if the target is forewarned. Obviously one cannot discuss secret methods in a public debate. And thirdly, emphasis should be on an all-round program—a regular battery of bombardment by guided missiles, balloons, sky-writing, indelible dyes, long-lived parrots, bottles in the Bosphorus, and so on. Just one neat stunt is not enough.

Looking forward to developments, I am—Hugh Walpole, 5801 Ellis Avenue, Chicago, Illinois.

Problem: How to communicate with someone who isn't supposed to listen!

Dear Mr. Campbell:

I am now preparing for publication as a hard-cover book an "Index to The Science-fiction Magazines." Started in 1935, it covers *all* of the American science fiction and most of the fantasy magazines from 1926 through 1950. Astounding SCIENCE FICTION and

its predecessor Astounding Stories are covered back to the first issue in 1930 as are the thirty-nine issues of *Unknown Worlds* as well as forty-three other titles, over one thousand two hundred and fifty individual magazines in all. All stories and articles are listed alphabetically both by title and author and there will be a checklist of all magazines indexed.

In addition, it is desired to include all the information on pseudonyms that can be definitely verified. To insure correctness, only data from such first-hand sources as the authors themselves, editors and agents will be used.

Therefore, I would like to ask that all authors who have used pen names in the science-fiction or fantasy fields send the information to me at the address below. In the case of personal pseudonyms, the name alone is sufficient. Where stories have appeared under "house names," I will need the titles of each story, together with the by-line under which they appeared.

Since transcription of the final copy from the file cards will begin shortly after the first of the year, the sooner this information is received, the more certain it is of inclusion.—Donald B. Day, 3435 NE 38th Avenue, Portland 13, Oregon.

It'll be a monumental job! But it should interest the collectors among our readers.

(Continued from page 81)

"And now—you've got a Telek to experiment on. Unless Dominion conceives a long-distance method of killing me. He's spending a restless night, I should imagine."

Circumbright grunted.

"First," said Shorn, "they put a bug on me. I expected it. They knew I expected it. I got rid of it in the Beaux-Arts Museum. Then I began thinking, since they would expect me to dodge the bug, and feel secure after I'd done so, no doubt they had a way to locate me again. Tracker material sprayed on my clothes, fluorescent in a nonvisual frequency. I threw away Cluche's clothes, which I didn't like in the first place, washed in three changes of solvicine and water, disposed of the red wig. Cluche Kurgill had disappeared. By the way, where is Cluche's body?"

"Safe."

"We can let it be found tomorrow morning. With a sign on him reading, 'I am a Telek spy.' Dominion will certainly hear of it; he'll think I'm dead, and that will be one problem the less."

"Good idea."

"But poor old Dr. Kurgill," remonstrated Laurie.

"He'll never believe such a note."

"No . . . I suppose not." She looked Shorn over from head to feet. "Do you feel different from before?"

"I feel as if all of creation were part of me. Identification with the cosmos, I guess you'd call it."

"But how does it work?"

Shorn deliberated. "I'm really not sure. I can move the chair the same way I move my arm, with about the same effort."

"Evidently," said Circumbright, "Geskamp had told them nothing of the mitrox under the stadium."

"They never asked him. It was beyond their imagination that we could conceive such an atrocity." Shorn laughed. "Dominion was completely flabbergasted. Bowled over. For a few minutes I think he was grateful to me."

"And then?"

"And then, I suppose he remembered his resentment, and began plotting how best to kill me. But I told him nothing until we were in the open air; any weapon he held I could protect myself from. A bullet I could think aside, even back at him; a heat-gun I could deflect."

"Suppose his will on the gun and your will clashed?" Circumbright asked mildly.

"I don't know what would happen. Perhaps nothing. Like a man vacillating between two impulses. Or perhaps the clash and the subsequent lack of reaction would invalidate both our confidences, and down we'd fall into the ocean. Because now we were standing on nothing, a thousand feet over the ocean."

"Weren't you afraid, Will?" asked Laurie.

"At first—yes. But a person becomes accustomed to the sensation very quickly. It's a thing we've all experienced in our dreams. Perhaps it's only a trifling aberration that stands in the way of telekinesis for everyone."

Circumbright grunted, loaded his pipe. "Perhaps we'll find that out, along with the other things."

"Perhaps. Already I begin to look at life and existence from another viewpoint."

Laurie looked worried. "I thought things were just the same."

"Fundamentally, yes. But this feeling of power—of not being tied down—" Shorn laughed. "Don't look at each other like that. I'm not dangerous. I'm only a Telek by courtesy. And now, where can we get three pressure suits?"

"At this time of night? I don't know."

"No matter. I'm a Telek. We'll get them. Provided of course you'd like to visit the Moon. All expense tour, courtesy of Adlari Dominion. Laurie, would you like to fly up, fast as light, fast as thought, stand in the Earth-shine, on the lip of Eratosthenes, looking out over the Mare Imbrium—"

She laughed uneasily. "I'd love it, Will. But—I'm scared."

"What about you, Gorman?"

"No. You two go. There'll be other chances for me."

Laurie jumped to her feet. Her cheeks were pink, her mouth was red

and half-open in excitement. Shorn looked at her with a sudden new vision. "Very well, Gorman. Tomorrow you can start your experiments. Tonight—"

Laurie found herself picked up, carried out through the window.

"Tonight," said Shorn by her side, "we'll pretend that we're souls—happy souls—exploring the universe."

Circumbright lived in a near-abandoned suburb to the north of Tran. His house was a roomy old antique, rearing like a balky horse over the Meyne River. Big industrial plants blocked the sky in all directions; the air reeked with foundry fumes, sulfur, chlorine, tar, burnt-earth smells.

Within, the house was cheerful and untidy. Circumbright's wife was a tall strange woman who worked ten hours a day in her studio, sculpturing dogs and horses. Shorn had met her only once; so far as he knew she had no interest or even awareness of Circumbright's anti-Telek activities.

He found Circumbright basking in the sun watching the brown river water roll past. He sat on a little porch he had built apparently for no other purpose but this.

Shorn dropped a small cloth sack in his lap. "Souvenirs."

Circumbright opened the bag unhurriedly, pulled out a handful of stones, each tagged with a card label. He looked at the first, hefted it.

"Agate." He read the label. "Mars. Well, well." A bit of black rock was next. "Gabbro? From . . . let's see. Ganymede. My word, you wandered far afield." He shot a bland blue glance up at Shorn. "Telekinesis seems to have agreed with you. You've lost that haggard hunted expression. Perhaps I'll have to become a Telek myself."

"You don't look haggard and hunted. Quite the reverse."

Circumbright returned to the rocks. "Pumice. From the Moon, I suppose." He read the label. "No—Venus. You made quite a trip."

Shorn looked up into the sky. "Rather hard to describe. There's naturally a feeling of loneliness. Darkness. Something like a dream. Out on Ganymede we were standing on a ridge, obsidian, sharp as a razor. Jupiter filled a third of the sky, the red spot right in the middle, looking at us. There was a pink and blue dimness. Peculiar. Black rock, the big bright planet. It was— weird. I thought, suppose the power fails me now, suppose we can't get home? It gave me quite a chill."

"You seem to have made it."

"Yes, we made it." Shorn seated himself, thrust out his legs. "I'm not hunted and haggard, but I'm confused. Two days ago I thought I had a good grasp on my convictions—"

"And now?"

"Now—I don't know."

"About what?"

"About—our efforts. Their ultimate effect, assuming we're successful."

"Hm-m-m." Circumbright rubbed his chin. "Do you still want to submit to experiments?"

"Of course. I want to know why and how telekinesis works."

"When will you be ready?"

"Whenever you wish."

"Now?"

"Why not? Let's get started."

"As soon as you're ready, we'll try encephalographs as a starting point."

Circumbright was tired. His face, normally pink and cherubic, sagged; filling his pipe, his fingers trembled.

Shorn leaned back in the leather chaise longue, regarded Circumbright with mild curiosity. "Why are you so upset?"

Circumbright gave the litter of paper on the workbench a contemptuous flick of the fingers. "It's the cursed inadequacy of the technique, the instruments. Trying to paint miniatures with a whisk broom, fix a watch with a pipe wrench. There"—he pointed—"encephalograms. Every lobe of your brain. Photographs—by X ray, by planar section, by metabolism triggering. We've measured your energy flow so closely that if you tossed me a tennis ball I'd find it on paper somewhere."

"And there's what?"

"Nothing suggestive. Wavy lines on the encephalograms. Increased oxygen

absorption. Pineal tumescence. All gross by-products of whatever is happening."

Shorn yawned and stretched. "About as we expected."

Circumbright nodded heavily. "As we expected. Although I hoped for—something. Some indication where the energy came from—whether through the brain, from the object itself, or from—nowhere."

Shorn caused water to leap from a glass, form a wet glistening hoop in the air. He set it around Circumbright's neck, started it contracting slowly.

"Hey," cried Circumbright reproachfully. "This is serious business."

Shorn snaked the water back in the glass.

Circumbright leaned forward. "Where do *you* feel the energy comes from?"

Shorn reflected. "It seems to be in matter itself—just as motion seems to be part of your hand."

Circumbright sighed in dissatisfaction. He continued half-querulously. "And at what speed does telekinesis work? If it's light-speed, then the action presumably occurs in our own space-time. If it's faster, then it's some other medium, and the whole thing's unknowable."

Shorn rose to his feet. "We can check the last with comparative facility."

Circumbright shook his head. "We'd need instruments of a preci-



sion I don't have on hand."

"No. Just a stop watch and—let's see. A flare, a timer, a couple of spacesuits."

"What's your idea?" Circumbright asked suspiciously.

"I'm taking you space-walking."

Circumbright rose uncertainly. "I'm afraid I'll be frightened."

"If you're an agoraphobe—don't try it."

Circumbright blew out his cheeks. "I'm not that."

"You wait here," said Shorn. "I'll be back in ten minutes with the spacesuits."

Half an hour later, they stumped out on Circumbright's little sun porch. Circumbright's outfit had been intended for a larger man; his head projected only half up into the head-bubble, to Shorn's amusement. "Ready?"

Circumbright, his blue eyes wide and solemn, nodded.

"Up we go."

Earth dwindled below, as if snatched out from under their feet. Speed without acceleration. To all sides was blackness, the black of vacancy, continuing emptiness. The moon rolled over their shoulders, a pretty pocked ball, black and silver.

The sun dwindled, became a disk of glare which seemed to cast no light, no heat. "We're seeing it by its high frequencies," Shorn observed. "A kind of reverse Doppler effect—"

"Suppose we run into an asteroid or

a meteorite?"

"Don't worry, we won't."

"How do you know? You couldn't stop in time."

Shorn ruminated. "No. It's something to think about. I'm not sure whether or not we have momentum. Another experiment for you to worry about. But after today I'll send some kind of shield out ahead of us, just in case."

"Where are we going?"

"Out to one of Jupiter's satellites. Look, there goes Mars." He dropped the telescopic lens in front of his eyes. "There's Io. We'll land on Io."

They stood on a dim gray table, a few feet above a tortured jumble of black scoriae. Frozen white stuff, like rock salt, lay in the crevices. The horizon was near, very sharp. Jupiter filled a quadrant of the sky to the left.

Shorn arranged the flare and the timer on a flat area. "I'll set it for ten minutes. Now—on the count of five I'll start the timer and you start your stop watch."

"Ready."

"One . . . two . . . three . . . four . . . five." He looked at Circumbright. Circumbright nodded. "Good. Now, we take ourselves out into space where we can watch."

Io dwindled to a tarnished metal disk, a bright spot.

"We're far enough, I think. Now we watch for the flare, and check the

time by your stop watch. The increment over ten minutes will give us the light-distance from Io to where we're—" Shorn considered. "What are we doing? Standing? Floating?"

"Waiting."

"Waiting. After knowing the light distance, we can make our tests."

"Are we sure that we're not moving now? If we're moving, our observations will be inaccurate."

Shorn shook his head. "We're not moving. It's the way telekinesis works. I stop us dead, in relation to Io, the same way a man on roller skates stops by grabbing a post. He just—stops himself."

"You know more about it than I do."

"It's more intuition than knowledge—which is suggestive in itself. How's the time?"

"Nine minutes. Ten . . . Twenty seconds. Thirty seconds. Forty. Fifty—one—two—three—"

They looked toward Io through the telescopic visors. Circumbright counted on in the same cadence. "Four—five—six—seven—eight—nine—ten minutes. One—two—three—"

A brief flicker appeared from the dull disk. Circumbright clamped down on the stem of his stop watch. "Three point six seconds. Allow two tenths of a second reaction time. That gives three point four seconds. Over six hundred thousand miles. Now what?"

"Let me have your stop watch.

I'll set it to zero. Now." Shorn squared himself toward Io. "Now we'll try telekinesis on a whole world."

Circumbright blinked. "Suppose there's not enough energy available?"

"We'll soon know." He looked at Io, pressed the stop watch starter.

One second—two seconds—three seconds—Io jerked ahead in its orbit.

Shorn looked at the stop watch. "Three point seven. A tenth of a second, which might be error. Apparently telekinesis works almost instantaneously."

Circumbright looked glumly out toward incandescent Sirius. "We'll play merry hell trying to get any significant results with my lab equipment. Somebody's got to invent some new tools—"

Shorn followed his gaze out toward Sirius. "I wonder what the limit of action is."

Circumbright asked doubtfully, "You're not going to try this . . . knack of yours on Sirius?"

"No. We'd have to wait eight years for the light to reach us. But—" He contemplated the massive form of Jupiter. "There's a challenging subject right there."

Circumbright said uneasily, "Suppose the effort drains the source of telekinetic energy—like a short circuit drains a battery? We might be left out here helpless—"

Shorn shook his head. "It wouldn't work that way. My mind is the critical factor. Size doesn't mean much, so

long as I can grasp it, take hold of all of it."

He stared at Jupiter. Seconds passed. "About now, if it's going to happen."

Jupiter quivered, floated up across twenty degrees of sky, dropped back into its former orbit.

Circumbright looked almost fearfully at Shorn. Shorn laughed shakily. "Don't worry, Gorman. I'm not out of my mind. But think of the future! All these wasted worlds moved in close, bathing in sunlight. Wonderful new planets for men to live on—"

They turned their faces toward the sun. Earth was a mist-white ball, growing larger. "Think," said Circumbright, "think of what a mad Telek could do. He could come out here as we did, pick up the Moon, toss it into North America or Europe as easily as dropping a rock into the mud. Or he could look at Earth, and it would start to move toward the sun—through the corona, and Earth would be singed, seared clean; he could drop it into a sunspot."

Shorn kept his eyes turned away from Earth. "Don't put ideas into my mind."

"It's a real problem," insisted Circumbright.

"I imagine that eventually there will be an alarm system of some kind; and as soon as it sounds, every mind will grab on to conditions as they are, and hold tight. Or maybe a corps of guardians—"

VII.

Back on Earth, in Laurie's apartment on upper Martinvelt, Shorn and Circumbright sat drinking coffee.

Circumbright was unaccustomedly nervous and consulted his watch at five-minute intervals.

Shorn watched quizzically. "Who are you expecting?"

Circumbright glanced quickly, guiltily, round the room. "I suppose there's no spy beetle anywhere close."

"Not according to the detector cell."

"I'm waiting for the messenger. A man called Luby, from East Shore."

"I don't think I know him."

"You'd remember him if you did."

Laurie said, "I think I hear him now."

She went to the door, slid it back. Luby came into the room, quiet as a cat. He was a man of forty who looked no more than seventeen. His skin was clear gold, his features chiseled and handsome, his hair a close cap of tight bronze curls. Shorn thought of the Renaissance Italians—Cesare Borgia, Lorenzo Medici.

Circumbright made introductions which Luby acknowledged with a nod of the head and a lambent look; then he took Circumbright aside, muttered in a rapid flow of syllables.

Circumbright raised his eyebrows, asked a question; Luby shook his head, responded impatiently. Circumbright nodded, and without another

word Luby left the room, as quietly as he had entered.

"There's a high-level meeting—policy makers—out at Portinari Gate. We're wanted." He rose to his feet, stood indecisively a moment. "I suppose we had better be going."

Shorn went to the door, looked out into the corridor. "Luby moves quietly. Isn't it unusual to concentrate top minds in a single meeting?"

"Unprecedented. I suppose it's something important."

Shorn thought a moment. "Perhaps it would be better to say nothing of my new—achievements."

"Very well."

They flew north through the night, into the foothills, and Lake Paienza spread like a dark blot below, rimmed by the lights of Portinari.

Portinari Gate was a rambling inn six hundred years old, high on a hillside, overlooking lake and town. They dropped to the soft turf in the shadow of great pines, walked to the back entrance.

Circumbright knocked, and they felt a quiet scrutiny.

The door opened, an iron-faced woman with a halo of iron-gray hair stood facing them. "What do you want?"

Circumbright muttered a password; silently she stepped back. Shorn felt her wary scrutiny as he and Laurie entered the room.

A brown-skinned man with black eyes and gold rings in his ears flipped

up a hand. "Hello, Circumbright."

"Hello . . . Thursby, this is Will Shorn, Laurita Chelmsford."

Shorn inspected the brown man with interest. The Great Thursby, rumored co-ordinator of the world-wide anti-Telek underground.

There were others in the room, sitting quietly, watchfully. Circumbright nodded to one or two, then took Shorn and Laurie to the side.

"I'm surprised," he said. "The brains of the entire movement are here." He shook his head. "Rather ticklish."

Shorn felt of the detector. "No spy cells."

More people entered, until possibly fifty men and women occupied the room. Among the last group was the young-old Luby.

A stocky dark-skinned man rose to his feet. "This meeting is a departure from our previous methods, and I hope it won't be necessary again for a long time."

Circumbright whispered to Shorn, "That's Kasselbarg, European Post."

Kasselbarg swung a slow glance around the room. "We're starting a new phase of the campaign. Our first was organizational; we built a world-wide underground, a communication system, set up a ladder of command. Now—the second stage: preparation for our eventual action . . . which, of course, will constitute the third stage.

"We all know the difficulties under

which we work: since we can't hold up a clear and present danger, our government is not sympathetic to us, and in many cases actively hostile—especially in the persons of suborned police officials. Furthermore we're under the compulsion of striking an absolutely decisive blow on our first sally. There won't be a second chance for us. The Teleks must be"—he paused—"they must be killed. It's a course toward which we all feel an instinctive revulsion, but any other course bares us to the incalculable power of the Teleks. Now, any questions, any comments?"

Shorn, compelled by a sudden pressure he only dimly understood, rose to his feet. "I don't want to turn the movement into a debating society—but there's another course where killing is unnecessary. It erases the need of the decisive blow, it gives us a greater chance of success."

"Naturally," said Kasselbarg mildly, "I'd like to hear your plan."

"No operation, plan it as carefully as you will, can guarantee the death of every Telek. And those who aren't killed may go crazy in anger and fear; I can picture a hundred million deaths, five hundred million, a billion deaths in the first few seconds after the operation starts—but does not quite succeed."

Kasselbarg nodded. "The need for a hundred per cent coup is emphatic. The formulation of such a plan will constitute Phase Two, of which I

just now spoke. We certainly can't proceed on any basis other than a ninety-nine per cent probability of fulfillment."

The iron-faced woman spoke. "There are four thousand Teleks, more or less. Here on Earth ten thousand people die every day. Killing the Teleks seems a small price to pay for security against absolute tyranny. It's either act now, while we have limited freedom of choice, or dedicate the human race to slavery for as long into the future as we can imagine."

Shorn looked around the faces in the room. Laurie was sympathetic; Circumbright looked away uncomfortably; Thursby frowned thoughtfully; Kasselbarg waited with courteous deference.

"Everything you say is true," Shorn said. "I would be the most ruthless of us all, if these four thousand deaths did not rob the human race of the most precious gift it possesses. Telekinesis to date has been misused; the Teleks have been remarkable for their selfishness and egotism. But in reacting to the Teleks' mistakes, we should not make mistakes of our own."

Thursby said in a cool clear voice, "What is your concrete proposal, Mr. Shorn?"

"I believe we should dedicate ourselves, not to killing Teleks, but to giving telekinesis to every sane man and woman."

A small red-haired man sneered,

"The ancient fallacy, privilege for the chosen ones—in this case, the sane. And who, pray, determines their sanity?"

Shorn smiled. "Your fallacy is at least an ancient; surely there's nothing occult about sanity. But let me return to my fundamental proposition—that taking telekinesis out of monopoly and broadcasting it is a better solution to the problem than killing Teleks. One way is up, the other down; building versus destruction. In one direction we put mankind at its highest potential for achievement; in the other we have four thousand dead Teleks, if our plan succeeds. Always latent is the possibility of a devastated world."

Thursby said, "You're convincing, Mr. Shorn. But aren't you operating on the unproved premise that universal telekinesis is a possibility? Killing the Teleks seems to be easier than persuading them to share their power; we've got to do one or the other."

Shorn shook his head. "There is at least two methods to create Teleks. The first is slow and a long-range job; that is, duplicating the conditions which produced the first Teleks. The second is much easier, quicker, and, I believe, safer. I have good reason for —" he stopped short. A faint buzzing, a vibration in his pocket.

The detector.

He turned to Luby, who stood by the door. "Turn out the lights! There's a Telek spy cell nearby! Out with the

lights, or we're all done for."

Luby hesitated. Shorn cursed under his breath. Thursby rose to his feet, startled and tense. "What's going on?"

There was a pounding at the door. "Open up, in the name of the law."

Shorn looked at the windows; the tough vitripane burst out; the windows were wide open. "Quick, out the window!"

Circumbright said in a voice of deadly passion, "Somewhere there's a traitor—"

A man in black and gold appeared at the window with a heat gun. "Out the door," he bellowed. "You can't get away, the place is surrounded. Move out the door in an orderly fashion; move out the door. You're all under arrest. Don't try to break for it, our orders are shoot to kill."

Circumbright sidled close to Shorn. "Can't you do something?"

"Not here. Wait till we're all outside; we don't want anyone shot."

Two burly troopers appeared in the doorway, gestured with pistols. "Outside, everybody. Keep your hands up."

Thursby led the way, his face thoughtful. Shorn followed; behind came the others. They marched into the parking area, now flooded with light from police lamps.

"Stop right there," barked a new voice.

Thursby halted. Shorn squinted against the searchlight; he saw a dozen

men standing in a circle around them.

"This is a catch and no mistake," muttered Thursby.

"Quiet! No talking."

"Better search them for weapons," came another new voice. Shorn recognized the dry phrasing, the overtones of careless contempt. Adlari Dominion.

Two Black and Golds walked through the group, making a quick search.

A mocking voice came from behind the searchlights. "Isn't that Colonel Thursby, the people's hero? What's he doing in this nasty little conspiracy?"

Thursby stared ahead with an immobile face. The red-haired man who had challenged Shorn cried, "You Telek boot-licker, may the money they pay rot the hands off your wrists!"

"Easy, Walter," said Circumbright.

Thursby spoke toward the lights. "Are we under arrest?"

There was no answer—a contemptuous silence.

Thursby repeated in a sharper tone. "Are we under arrest? I want to see your warrant; I want to know what we're charged with."

"You're being taken to headquarters for questioning," came the reply. "Behave yourselves; if you've committed no crime, there'll be no charge."

"We'll never reach headquarters," Circumbright muttered to Shorn.

Shorn nodded grimly, staring into the lights, seeking Dominion. Would he recognize the Cluche Kurgill whom he had invested with Telek power?

The voice called out, "Were you contemplating resistance to arrest? Go ahead. Make it easy on us—"

There was motion in the group, a swaying as if from the wind which moved the tops of the dark pine trees.

The voice said, "Very well then, march forward, one at a time. You first, Thursby."

Thursby turned slowly, like a bull, followed the trooper who walked ahead waving a flashlight.

Circumbright muttered to Shorn, "Can't you do something?"

"Not while Dominion is out there—"

"Silence!"

One by one, the group followed Thursby. An air barge loomed ahead, the rear hatch gaping like the mouth of a cave.

"Up the ramp; inside."

The hold was a bare, metal-walled cargo space. The door clanged shut, and the fifty captives stood in sweating silence.

Thursby's voice came from near the wall. "A clean sweep. Did they get everybody?"

Circumbright answered in a carefully toneless voice. "So far as I know."

"This will set the movement back ten years," said another voice, controlled but tremulous.

"More likely destroy it entirely."

"But—what can they convict us of? We're guilty of nothing they can prove."

Thursby snorted. "We'll never get to Tran. My guess is gas."

"Gas?"—a horrified whisper.

"Poison gas pumped through the ventilator. Then out to sea, drop us, and no one's the wiser. Not even 'killed while escaping.' Nothing."

The aircraft vibrated, rose into the air; under their feet was the soft feeling of air-borne flight.

Shorn called out softly. "Circum-bright?"

"Right here."

"Make a light."

A paper torch ignited by a cigarette lighter cast a yellow flicker around the hold; faces glowed pale and damp as toad-bellies; eyes glared and reflected in the flare of the torch.

The row of ports was well shuttered, the hand-keys were replaced by bolts. Shorn turned his attention to the door. He had moved the planet Jupiter; he should be able to break open a door. But the problem was different; in a sense this bulging open of a door was a concept several times more advanced than movement of a single object, no matter how large. There was also a psychological deterrent in the fact that the door was locked. What would happen if he attempted to telekinecize and nothing happened? Would he retain his power?

Thursby was standing with his ear to the ventilator. He turned, nodded. "Here it comes. I can hear the hiss—"

The paper torch was guttering; in darkness Shorn was as helpless as the others. Desperately he plunged his mind at the door; the door burst open, out into the night. Shorn caught it before it fluttered away into the dark air, brought it edgewise back through the door opening.

The wind had blown out the torch; Shorn could only vaguely feel the black bulk of the door. He yelled, to be heard over the roar of the wind rushing past the door, "Stand back, stand back—" He could wait no longer; he felt reality slipping in the darkness; the door was only a vague blot. He concentrated on it, strained his eyes to see, hurled it against the metal hull, stove out a great rent. Air swept through the hold, whisked out any gas which might have entered.

Shorn took himself out the door, rose above the cabin, looked through the sky dome. A dozen Black and Gold troopers sat in the forward compartment, looking uneasily back toward the cargo hold whence had come the rending jar. Adlari Dominion was not visible. Luby, the bronze-haired courier with the medallion face, sat statue-quiet in a corner. Luby was to be preserved, thought Shorn. Luby was the traitor.

He had neither time nor inclination for half-measures. He tore a strip off the top of the ship; the troopers and

Luby looked up in terror. If they saw him at all, he was a white-faced demon of the night, riding the wind above them. They were shucked out of the cabin like peas from a pod, flung out into the night, and their cries came thinly back to Shorn over the roar of the wind.

He jumped down into the cabin, cut off the motors, jerked the cylinder of gas away from the ventilation system, then whisked the craft east, toward the Monaghill Mountains.

Clouds fell away from the moon; he saw a field below. Here was as good a spot as any to land and reorganize.

The aircraft settled to the field. Dazed, trembling, buffeted, fifty men and women crept from the hold.

Shorn found Thursby leaning against the hull. Thursby looked at him through the moonlight as a child might watch a unicorn. Shorn grinned. "I know you must be puzzled; I'll tell you all about it as soon as we're settled. But now—"

Thursby squinted. "It's hardly practical our going home, acting as if nothing had happened. The Black and Golds took photographs; and there's a number of us that—are not unknown to them."

Circumbright appeared out of the darkness like a pink and brown owl. "There'll be a great deal of excitement at the Black and Gold headquarters when there's no news of this hulk."

"There'll be a great deal of irrita-

tion at Glarietta Pavilion."

Shorn counted the days on his fingers. "Today is the twenty-third. Nine days to the first of the month."

"What happens on the first of the month?"

"The First Annual Telekinetic Olympiad, at the new stadium in Swanscomba Valley. In the meantime—there's an old mine back of Mount Mathias. The bunkhouses should hold two or three hundred."

"But there're only fifty of us—"

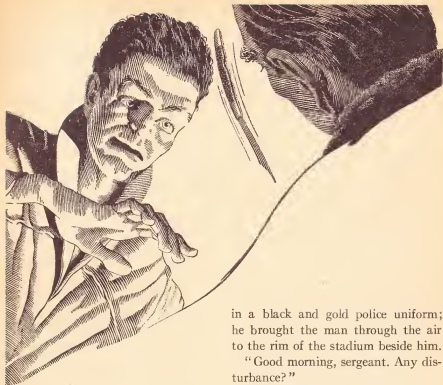
"We'll want others. Two hundred more. Two hundred good people. And to avoid any confusion"—he looked around to find the red-haired man who thought that sanity was no more than a function of individual outlook—"we will equate goodness to will to survival for self, the family group, human culture and tradition."

"That's broad enough," said Thursby equable, "to suit almost anyone. As a practical standard—?" In the moonlight Shorn saw him cock his eyebrows humorously.

"Practically," said Shorn, "we'll pick out people we like."

VIII.

Sunday morning, June the first, was dull and overcast. Mist hung along the banks of the Swanscomba River as it wound in its new looping course down the verdant valley; the trees dripped with clammy condensations.



At eight o'clock a man in rich garments of purple, black and white dropped from the sky to the rim of the stadium. He glanced up at the overcast, the cloud-rack broke open like a scum, slid across the sky.

Horizon to horizon the heavens showed pure and serene blue; the sun poured warmth into Swanscomba Valley.

The man looked carefully around the stadium, his black eyes keen, restless. At the far end stood a man

in a black and gold police uniform; he brought the man through the air to the rim of the stadium beside him.

"Good morning, sergeant. Any disturbance?"

"None at all, Mr. Dominion."

"How about below?"

"I couldn't say, sir. I'm only responsible for the interior, and I've had the lights on all night. Not a fly has showed itself."

"Good." Dominion glanced around the great bowl. "If there are no trespassers now, there won't be any, since there's no ground level entrance."

He took himself and the trooper to the ground. Two other men in uniform appeared.

"Good morning," said Dominion.

"Any disturbance?"

"No sir. Not a sound."

"Curious." Dominion rubbed his pale peaked chin. "Nothing below the stadium?"

"Nothing, sir. Not a nail. We've searched every nook and cranny, down to bedrock, inch by inch."

"Nothing on the detectors?"

"No, sir. If a gopher had tunneled under the stadium, we'd have known it."

Dominion nodded. "Perhaps there won't be any demonstration after all." He stroked his chin. "My intuition is seldom at fault. But never mind. Take all your men, station them at the upper and lower ends of the valley. Allow no one to enter. No one, on any pretext whatever. Understand me?"

"Yes, sir."

"Good."

Dominion returned to the rim of the stadium, gazed around the sunny bowl. The grass was green and well-cropped; the colored upholstery of the chairs made circular bands of pastel around the stadium.

He took himself through the air to the director's cupola, an enclosed booth hanging in a vantage point over the field on a long transparent spar. He entered, seated himself at the table, switched on the microphone. "One—two—three." He stopped, listened. His voice, channeled to speakers in the arms of each of the seats, came back to him as a husky murmur.

Other Teleks began to arrive, dropping like brilliant birds from the sky, settling to bask in the sunlight. Refreshment trays floated past; they sipped fruit juice, tea, and ate mint-cakes.

Dominion left the high cupola, drifted low over the stadium. There was no expectation of filling it; thirty thousand seats would allow room for future increase. Thirty thousand teleks was the theoretical limit that the economy of Earth could maintain at the present standard of living. And after thirty thousand? Dominion shrugged aside the question; the problem had no contemporary meaning. The solution should prove simple enough; there had been talk of swinging Venus out into a cooler orbit, moving in Neptune, and creating two habitable worlds by transferring half of Neptune's mantle of ice to dusty Venus. A problem for tomorrow. Today's concern was the creation of the Telek Earth State, the inculcation of religious awe into the common folk of Earth—the only means, as it had been decided, to protect Teleks from witless assassination.

He dropped into a group of friends, seated himself. His work was done for the day; now, with security achieved, he could relax, enjoy himself.

Teleks came in greater numbers. Here was a large group—fifty together. They settled into a section rather high up on the shady side, somewhat apart from the others. A

few minutes later another group of fifty joined them, and later there were other similar groups.

At nine o'clock the program of events got under way. A whirlpool of jewel colors glinted high in the sky—A dozen great ice prisms appeared, each frozen from water of a different color.

They commenced to revolve in a circle, rotating at the same time; shafts of colored light—red, gold-yellow, emerald, blue—played around the stadium. Then each of the prisms broke into twenty sections, and the pieces swung, swirled like a swarm of polychrome fireflies. With a great swoop, they disappeared into the sky.

The voice of Lemand De Troller, Program Director, sounded from the speakers:

"Sixty years ago, at the original Telekinetic Congress, our race was born. Today is the first annual convention of the issue of these, early giants, and I hope the custom will persist down the stream of history, down the million years that is our destined future, ten million times a million years.

"Now—the program for the day. Immediately following will be a game of bump-ball, for the world championship, between the Crimean Blues and the Oslandic Vikings. Then there will be a water-sculpture contest and display, and next—arrow duelling, followed by an address by Miss Gloriana

Hallen, on the Future of Telekinesis, and then lunch will be served on the turf—"

Circumbright and Shorn listened with mounting dissatisfaction. The program director finished. "—the final valediction by Graycham Gray, our chairman for the year."

Circumbright said to Shorn, "There's nothing there, no mass telekinesis in the entire program."

Shorn said nothing. He leaned back in his seat, looked up to the director's cupola.

"Ample opportunity for mass exercise," complained Circumbright "and they overlook it entirely."

Shorn brought his attention back down from the cupola. "It's an obvious stunt—perhaps too obvious for such a sophisticated people."

Circumbright scanned the two hundred and sixty-five men and women in radiant Telek costumes that Shorn had brought into the stadium, fifty at a time. "Do you suppose that the program as it stands will do the trick?"

Shorn shook his head fretfully. "Doesn't seem possible. Not enough mass participation." He looked over his shoulder to Thursby, in the seat behind him. "Any ideas?"

Thursby in brown and yellow said tentatively, "We can't very well force them to indoctrinate us."

Laurie, beside Shorn, laughed nervously. "Let's send Circumbright out to plead with them."

Shorn moved restlessly in his seat. Two hundred and sixty-five precious lives, dependent for continued existence on his skill and vigilance. "Maybe something will turn up."

The game of bump-ball was under way. Five men lying prone in eight-foot red torpedoes competed against five men in blue torpedoes, each team trying to bump a floating three-foot ball into the opposition goal. The game was lightning swift, apparently dangerous. The ten little boats moved so fast as to be mere flickers; the ball slammed back and forth like a ping-pong ball.

Shorn began to notice curious glances cast up toward his group. There was no suspicion, only interest; somehow they were attracting attention. He looked around, and saw his group sitting straight and tense as vestrymen at a funeral—obviously uneasy and uncomfortable. He rose to his feet, spoke in an angry undertone, "Show a little life; act as if you're enjoying yourselves!"

He turned back to the field, noticed a service wagon not in use, pulled it up, moved it past his charges. Gingerly they took tea, rum punch, cakes, fruit. Shorn set the case back on the turf.

The bump-ball game ended; now began the water sculpture. Columns of water reared into the air: thousands of gallons, working into glistening soft forms. Quivering pliant water caught

the sunlight, glowed deep from within the non-objectives, the human figures, the heads, the interlocking geometric patterns.

Event followed event: competitions and displays in color, skill, ingenuity, swift reaction; arrows were pitted against arrows each trying to pierce the bladder trailed by the other. Colored spheres were raced through an obstacle course; there was an exhibition in which sparrows were released and after an interval herded into a basket by a small white tambourine.

The air over the stadium swam with fascinating colors, shapes, tapes, screens, and so passed the morning. At twelve laden buffet tables dropped from the sky to the stadium turf. And now Shorn found himself on the horns of a dilemma. By remaining aloof from the tables his group made themselves conspicuous; but they risked quick detection by mingling with the Teleks.

Thursby resolved the problem. He leaned forward. "Don't you think we'd better go down to lunch? Maybe a few at a time. We stick out like a sore thumb sitting up here hungry."

Shorn nodded acquiescently. By ones and twos he set the members of his company down to the sward. Laurie nudged him. "Look. There's Dominion. He's talking to old Poole."

Circumbright in unusual agitation said: "I hope Poole keeps his wits about him."

Shorn smiled grimly. "If Dominion makes one move—" Circumbright saw one of the duelling arrows lift easily into the air. Dominion turned away. Shorn sighed. The arrow returned to the turf.

A moment later he brought Poole back to his seat. "What did Dominion want?"

Poole was a scholarly-looking man of middle age, mild and myopic. "Dominion? Oh, the gentleman who spoke to me. He was very pleasant. Asked if I were enjoying the spectacles, and said that he didn't think he recognized me."

"And what did you say?"

"I said I didn't get out very much, and that there were many here I hardly knew."

"And then?"

"He just moved away."

Shorn sighed. "Dominion is very sharp."

Thursby wore a worried frown. "Things haven't gone so well this morning."

"No. But there's still the afternoon."

The afternoon program began with a score of young Telek girls performing an air ballet.

IX.

Three o'clock.

"There's not much more," said Circumbright.

Shorn sat hunched forward. "No."

Circumbright clenched the arms of his seat. "We've got to do something—and I know what to do."

"What?"

"Drop me down to the field. I'll pick up the arrows, and you start picking off Teleks. Dominion first. Then they'll all—"

Shorn shook his head. "It wouldn't work. You'd be throwing away your life for nothing."

"Why wouldn't it work?" Circumbright demanded belligerently.

Shorn gestured to the two hundred and sixty-five. "Do you think we could arouse a real rapport in the business of pulverizing you? No." He looked up to the director's cupola. "It's got to come from there. And I've got to arrange it." He reached over, clasped Laurie's hand, nodded to Thursby, rose to his feet, took himself by an inconspicuous route along the back wall, up to the transparent spar supporting the cupola. Inside he glimpsed the shapes of two men.

He slid back the door, entered quietly, froze in his footprints. Adlari Dominion, lounging back in an elastic chair, smiled up at him, ominous as a cobra. "Come in. I've been expecting you."

Shorn looked quickly to Lemand De Troller, the program director, a bulky blond man with lines of self-indulgence clamping his mouth.

"How so?"

"I have a pretty fair idea of your intentions, and I admit their ingenu-

ity. Unluckily for you, I inspected the body of Cluche Kurgill, assassinated a short time ago, and it occurred to me that this was not the man whom I entertained at Glarietta; I have since reprimanded myself for not scrutinizing the catch at Portinari Gate more carefully. In any event, today will be a complete debacle, from your standpoint. I have excised from the program any sort of business which might have helped you."

Shorn said thickly, "You showed a great deal of forbearance in allowing us to enjoy your program."

Dominion made a lazy gesture. "It is as well not to bring our problems too sharply to the attention of the spectators; it might lay a macabre overtone upon the festival, for them to observe at close hand two hundred and sixty-five condemned anarchists and provocateurs."

"You should have been made very uncomfortable if I had not come up here to the cupola."

Dominion shook his head indulgently. "I asked myself, what would I do in your position? I answered, I would proceed to the cupola and myself direct such an event to suit my purposes. So—I preceded you." He smiled. "And now—the sorry rebellion is at its end. The entire nucleus of your gang is within reach, helpless; if you recall, there is no exit, they have no means to scale the walls."

Shorn felt thick bile rising in his throat; his voice sounded strange to

his ears. "It's not necessary to revenge yourself on all these people; they're merely decent individuals, trying to cope with—" He spoke on, pleading half-angrily for the two hundred and sixty-five. Meanwhile his mind worked at a survival sub-level. Dominion, no matter how lazy-seeming and catlike, was keyed-up, on his guard; there would be no surprising him. In any struggle Lemand De Troller, the program director, would supply the decisive force. Shorn might be able to parry the weapons of one man, but two cores of thought would be too much for him.

Decision and action came to him simultaneously. He gave the cupola a great shake; startled, De Troller seized the desk. Shorn threw a coffee mug at his head. Instantly, before the mug had even struck, he flung himself to the floor. Dominion, seizing the instant of Shorn's distraction, had aimed a gun at him, fired an explosive pellet. Shorn hit the floor, saw De Troller slump, snatched the weapon from Dominion's hand, all at once.

The gun clattered to the deck, and Shorn found himself looking into Dominion's pale glowing eyes.

Dominion spoke in a low voice, "You're very quick. You've effectively reduced the odds against yourself."

Shorn smiled tightly. "What odds do you give me now?"

"Roughly, a thousand to one."

"Seems to me they're even. You against me."

"No. I can hold you helpless, at the very least, until the program property man returns."

Shorn slowly rose to his feet. Careful. Let no movement escape his eye. Without moving his eyes from Dominion's, he lifted the coffee mug, hurled it at Dominion's head. Dominion diverted it, accelerated it toward Shorn. Shorn bounced it back, into Dominion's face. It stopped only an inch short, then sprang back at Shorn's head with tremendous speed. Shorn flicked it with a thought, he felt the breath of its passage and it shattered against the wall.

"You're fast," said Dominion lightly. "Very fast indeed. In theory, your reactions should have missed that."

Shorn stared at him thoughtfully. "I've got a theory of my own."

"I'd like to hear it."

"What happens when two minds try to teleport an object in opposing directions?"

Dominion frowned slightly. "A very exhausting matter, if carried to the limit. The mind with the greater certainty wins, the other mind—sometimes—lapses."

Shorn stared at Dominion. "My mind is stronger than yours."

Dominion's eyes lit up with a peculiar inner glow, then filmed over. "Very well, suppose it is? What do I gain in proving otherwise?"

Shorn said, "If you want to save your life—you'll have to." With his eyes still on Dominion, he took a knife from his pocket, flicked open the blade.

It leaped from his hand at his eyes. He frantically diverted it, and in the instant his defense was distracted, the gun darted to Dominion's hand. Shorn twisted up the muzzle by a hair's-breadth; the pellet sang past his ear.

Fragments of the coffee mug pelted the back of his head, blinding him with pain. Dominion, smiling and easy, raised the gun. It was all over, Shorn thought. His mind, wilted and spent, stood naked and bare of defense—for the flash of an instant. Before Dominion could pull the trigger, Shorn flung the knife at his throat. Dominion turned his attention away from the gun to divert the knife; Shorn reached out, grabbed the gun with his bare hands, tossed it under the table out of sight.

Dominion and Shorn glared eye to eye. Both of them thought of the knife. It lay on the table, and now under the impulse of both minds, slowly trembled, rose quivering into the air, hilt up, blade down, swinging as if hung by a short string. Gradually it drifted to a position midway between their eyes.

The issue was joined. Sweating, breathing hard, they glared at the knife, and it vibrated, sang to the induced quiver from the opposing efforts. Eye to eye stared Dominion and

Shorn, faces red, mouths open, distorted. No opportunity now for diversionary tactics; relax an instant and the knife would stab; blunt force strained against force.

Dominion said slowly, "You can't win, you who have only known telekinesis a few days; your certainty is as nothing compared to mine. I've lived my lifetime in certainty; it's part of my living will, and now see—your reality is weakening, the knife is aiming at you, to slash your neck."

Shorn watched the knife in fascination, and indeed it slowly turned toward him like the clock-hand of Fate. Sweat streamed into his eyes; he was aware of Dominion's grimace of triumph.

No. Allow no words to distract you; permit no suggestion; bend down Dominion's own resolution. His vocal chords were like rusty wire, his voice was a croak.

"My certainty is stronger than yours, because"—as he said the words the knife halted its sinister motion toward his throat—"time has no effect upon telekinesis! Because I've got the will of all humanity behind me, and you've got only yourself!"

The knife trembled, twisted, as if it were a live thing, tortured by indecision.

"I'm stronger than you are, because—I've got to be!" He sank the words into Dominion's mind.

Dominion said quickly, "Your neck hurts, your mind hurts, you cannot

see."

Shorn's neck hurt indeed, his head ached, sweat stung his eyes, and the knife made a sudden lurch toward him. This can't go on, thought Shorn. "I don't need tricks, Dominion; you need them only because your confidence is going and you're desperate." He took a deep breath, reached out, seized the knife, plunged it into Dominion's breast.

Shorn stood looking down at the body. "I won—and by a trick. He was so obsessed by the need for defeating me mentally that he forgot the knife had a handle."

Panting he looked out over the stadium. Events had come to a halt. The spectators restively waited for word from the program director.

Shorn picked up the microphone.

"Men and women of the future—" as he spoke he watched the little huddle of two hundred and sixty-five. He saw Laurie stir, look up; he saw Circumbright turn, clap Thursby's knee. He felt the wave of thankfulness, of hero-worship, almost insane in its fervor that welled up from their minds. At that moment he could have commanded any of them to their death.

An intoxicated elation came to him; he fought to control his voice. "This is an event improvised to thank Lemand De Troller, our program director, for his work in arranging the events. All of us will join our telekin-

etic powers together; we will act as one mind. I will guide this little white ball"—he lifted a small ball used in the obstacle race—"through the words 'Thank you, Lemand De Troller.' You, with your united wills, will follow with the large bump-ball." He rolled it out into the center of the stadium. "With more preparation we would have achieved something more elaborate, but I know Lemand will be just as pleased if he feels all of us are concentrating on the big ball, putting our hearts into the thanks. So—now. Follow the little white ball."

Slowly he guided the white ball along imaginary block letters in the air; faithfully the big bump-ball followed.

It was finished.

Shorn looked anxiously toward Circumbright. No signal.

Once again.

"Now—there is one other whom we owe a vote of thanks: Adlari Domin-

ion, the capable liaison officer. This time we will spell out, 'Thank you and good luck, Adlari Dominion.'"

The white ball moved. The big ball followed. Four thousand minds impelled, two hundred and sixty-five minds sought to merge into the pattern: each a new Prometheus trying to steal a secret more precious than fire from a race more potent than the Titans.

Shorn finished the last N, glanced toward Circumbright. Still no signal. Anxiety beset him; was this the right indoctrination technique? Suppose it was only effective under special conditions, suppose he had been operating on a misapprehension the entire time?

"Well," said Shorn doggedly, "once again." But the spectators would be growing restless. Who to thank this time?

The ball was moving of its own volition. Shorn, fascinated, followed

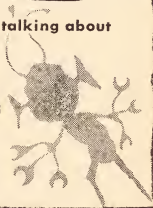
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its path. It was spelling a word.

W - I - L - L—then a space—
S - H - O - R - N—another space—
T - H - A - N - K - S.

Shorn sank back into the elastic seat, his eyes brimming with tears of release and thankfulness. "Someone is thanking Will Shorn," he said into the microphone. "It's time for them to leave." He paused. Two hundred and sixty-five new telekinetics lifted themselves from the stadium, flew west toward Tran, disappeared into the afternoon.

Shorn returned to the microphone. "There're a few more words I want to say; please be patient a moment or two longer.

"You have just been witnesses—unwitting witnesses—to an event as important as Joffrey's original congress. The future will consider the sixty-year interval only a transition, humanity's final separation from the beast.

"We have completely subdued the material world; we know the laws governing all the phenomena that our senses can detect. Now we turn ourselves into a new direction; humanity enters a new stage, and wonderful things lie before us." He noticed a ripple of uneasiness running along the

ranks of the Teleks. "This new world is on us, we can't evade it. For sixty years the Teleks have rejoiced in a state of special privilege, and this is the last shackle humanity throws off: the idea that one man may dominate or control another man."

He paused; the uneasiness was ever more marked.

"There are trying times to come—a period of severe readjustment. At the moment you are not quite certain to what I am referring, and that is just as well. Thank you for your attention and good-by. I hope you enjoyed the program as much as I did."

He rose to his feet, stepped over Dominion's body, slid back the door, stepped out of the cupola.

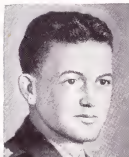
Teleks leaving the stadium rose up past him like May flies, some turning him curious glances as they flew. Shorn, smiling, watched them flit past, toward their glittering pavilions, their cloud-castles, their sea-bubbles. The last one was gone; he waved an arm after them as if in valediction.

Then he himself rose, plunged westward toward the sword-shaped towers of Tran, where two hundred and sixty-five men and women were already starting to spread telekinesis through all of mankind.

THE END



Medal of Honor



*Sergeant Truels Watkins,
Gladesater, Tex.—Medal of Honor*



*Lieutenant Frederick Henry,
Clinton, Okla.—Medal of Honor*



*Sergeant Charles Turner,
Boston, Mass.—Medal of Honor*

This is the season when you think of stars. The one over Bethlehem.
The ones on Christmas trees.

But this year remember another star, too—the one on the Medal of Honor.
And make a place in your heart for the brave, good men who've won it.
Men who, oftener than not, made the final, greatest sacrifice—so that
the stars on your Christmas tree, and the stars in your country's flag,
might forever shine undimmed.

Right now—today—is the time to do something important for these men who
died for you. You can, by helping to defend the country they defended so far
“above and beyond the call of duty.”

One of the best ways you can make defense *your* job, too, is to buy more . . .
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strengthen America. And if you make this nation strong enough you'll
create, and keep, the peace for which men died.

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